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Further details in SAUNDERS ADVERTISEMENT—Page 3

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FEVER THERAPY FOR GONOCOCCIC INFECTIONS

ARTHUR U. DESJARDINS, M.D.
LOUIS G. STUHLER, M.D.
AND
WALTER C. POPP, M.D.
ROCHESTER, MINN.

For generations, gonococcic urethritis has been treated mainly by irrigating, or by injecting into the urethra various chemical solutions that were thought to have an antiseptic or germicidal effect. The gamut of the so-called urethral germicides has been run from the old standbys potassium permanganate and the "nonirritating" silver proteins argyrol and protargol to another group of miracle workers, the aniline dyes, mercurochrome, gentian violet and acriflavine. Each group and each substance has had its more or less vociferous protagonists, but the use of such substances is now gradually diminishing. This is not to imply that all these different chemical substances do not have any therapeutic value, but only that at various times too much reliance has been placed on this or that compound or group of compounds.

There is no doubt that many patients with gonorrhea have been cured by such methods, but many other patients have not been cured or have been cured only after weeks or months of treatment. So true is this that one cannot help wondering whether the disease was cured as the result of the treatment or as the result of those internal factors which constitute the natural defense against infection. In any event it cannot be denied that, even at the present time, the treatment of gonorrhea is an uncertain affair.

BACTERICIDAL ACTION OF HEAT ON THE GONOCOCCUS

In the past, many observers have noted an inhibitory effect of high temperature on gonococcic infections. Thus, Finger, Ghon and Schlagenhaufer [1] failed to induce urethritis by injecting gonococci into the urethra of a patient who already had a temperature of 39 or 40 C. (102.2 or 104 F.), whereas urethritis always developed when the organisms were injected into afebrile subjects. Guiard [2] in 1894 had a patient with gonorrhea whose urethral infection subsided spontaneously after scarlet fever. Bogdan [3] in 1893 cited a case of gonorrhea in which the urethral discharge had spontaneously disappeared during an attack of pneumonia but recurred after the fever had subsided. Neisser and Scholtz [4] always found it difficult to cultivate the gonococcus in cases in which patients had a fever. Luys [5] in 1917 made a similar observation after a patient of his had had an attack of mumps during which the temperature had attained 40 C. (104 F.). Culver [6] recorded a similar case in 1917 in which the urethral infection was cured after the patient had had a four-day bout of malaria, with a temperature of 40.5 C. (104.9 F.). He claimed that a sudden rise of temperature to 39 C. (102.2 F.) was sufficient to destroy the gonococcus. However, the experience of others, such as Nobl [7] and Nicoll,[8] was different.

Bacteriologists have long known that Neisseria gonorrhoeae can best be isolated and cultivated at a temperature of 37 C. (98.6 F.), and that the organism does not grow so well at temperatures greater than 38 C. (100.4 F.). Steinschneider and Schäffer [9] in 1895 noted that a temperature of from 40 to 41 C. (104 to 105.8 F.) for a few hours was sufficient to kill the gonococcus. Wertheim [10] in 1900 claimed that the organism grows well at 40 C. (104 F.) and can even tolerate 42 C. (107.6 F.), but this claim has not been substantiated by other investigators. Santos [11] was able in 1913 to isolate gonococci from pus that had been subjected to a temperature of 45 C. (113 F.) for less than forty-five minutes or to a temperature of 50 C. (122 F.) for less than five minutes. Ungermann,[12] on the other hand, found that some strains of gonococcus resisted 41 C. (105.8 F.) for ten hours and that a few strains even withstood 52 C. (125.6 F.) for seven hours. On heating the male urethra with diathermy, Boerner and Santos [13] could not isolate the gonococcus after ten hours at 39 C. (102.2 F.), three hours at 41 C. (105.8 F.), and fifty-seven minutes at 41.7 C. (107 F.). Ylppö [14] treated vulvovaginitis of a girl, aged 5 years,

From the Section on Fever Therapy (Drs. Desjardins and Popp) and the Section on Urology (Dr. Stuhler), the Mayo Clinic.

1. Finger, E.; Ghon, A., and Schlagenhaufer, F.: Beiträge zur Biologie des Gonococcus und zur pathologischen Anatomie les gonorrhoischen Processes, Arch. f. Dermat. u. Syph. **28:** 3, 1894.
2. Guiard, F. P.: La blennorragie chez l'homme, historique, bactériologie, clinique: Traitements anciens et nouveaux, Préface du Professeur F. Guyon, Paris, Rueffet Cie, 1894, p. 284.
3. Bogdan, M.: Disparition d'un écoulement blennorragique pendant le cours d'une pneumonie: retour de l'écoulement après la guérison, Arch. de dermat. et syph. **4:** 253, 1893.
4. Neisser, A., and Scholtz, W.: Gonorrhoe, in Handbuch der pathogenen Mikroorganismen, Jena **3:** 168, 1903.
5. Luys, G.: Textbook on Gonorrhea and Its Complications, London, Bailliere, Tindall & Cox, 1917, pp. 25-26.
6. Culver, Harry: The Treatment of Gonorrheal Infections by the Intravenous Injection of Killed Gonococci, Meningococci and Colon Bacilli. J. A. M. A. **68:** 362 (Feb. 3) 1917.
7. Nobl, G.: Klinischer Beitrag zur Biologie der Gonococcen, Wien. Klin. Rundschau **46:** 863, 886, 1901.
8. Nicoll, M.: Three Cases of Gonococcus Septicemia with Arthritis Following Scarlet Fever, Arch. Pediat. **31:** 804, 1914.
9. Steinschneider and Schäffer: Zur biologie der Gonokokken, Berl. klin. Wchnschr. **32:** 984, 1895.
10. Wertheim, E.: Ueber das Verhalten des Gonococcus auf künstlichen Nährböden, Arch. f. Dermat. u. Syph. **51:** 139, 1900.
11. Santos, G.: Résistance du gonocoque aux températures de 45° et 50°: Action directe des courants de diathermie, Arq. do Inst. bact. Camara Pestana **4:** 211, 1913.
12. Ungermann, E.: Eine einfache Methode zur Gewinnung von Dauerkulturen empfindlicher Bakterienarten und zur Erhaltung der Virulenz tier-pathogener Keime, Arb. a. d. k. Gsndhtsamte **51:** 180, 1919.
13. Boerner, R., and Santos, C.: Ueber eine neue Art von Elektroden zur Behandlung der Gonorrhöe mittels Diathermie, Med. Klin. **10:** 1062, 1914.
14. Ylppö, A.: Ueber die "Fieberbehandlung" der Vulvovaginitis gonorrhoica bei kleinen Mädchen, Therap. Monatsh. **30:** 580, 1916.

by means of hot baths, beginning at a temperature of 39 C. (102.2 F.) and gradually increasing the temperature of the water to 41.5 C. (106.7 F.). After eight daily baths of one hour, Ylppö could no longer isolate the gonococcus. Koch and Cohn [15] in 1928 expressed the opinion that the gonococcus can more readily tolerate a high temperature when in vivo than when in vitro. This opinion rested on the fact that, during an acute infectious disease in man, the infection may resist a temperature of 40 C. (104 F.) for several days.

FEVER THERAPY BY MODERN METHODS

For a number of years artificial fever, induced by the injection of bacteria or protein substances, by general diathermy or by short wave radiations, the heating effect of which had been fortuitously discovered by Whitney, who also realized its possible therapeutic value, has been used to treat syphilis of the nervous system, chronic arthritis and certain other conditions. During the last few years also the value of this method in treating acute gonococcic arthritis has been made increasingly clear. The rapid relief from pain and subsidence of inflammation obtained by thorough heating of the affected joints themselves, without general elevation of body temperature, is remarkable enough; but still more startling is the almost theatrical effect of increasing the general body temperature of such patients to between 41.1 C. (106 F.) and 41.7 C. (107 F.) and maintaining it at this level for five or more hours.

Quite naturally, observations of this kind led a few physicians to consider the possible value of such a procedure in gonococcic infections of the urethra and its associated structures. This possibility was brought into the realm of probability by the fundamental experiments of Carpenter, Boak, Mucci and Warren.[16] These investigators undertook the task of determining the thermal death time of the gonococcus at temperatures that can be tolerated by man. They subjected fifteen strains of Neisseria gonorrhoeae to temperatures of 39, 40, 41, 41.5 and 42 C. (102.2, 104, 105.8, 106.7 and 107.6 F.). The different strains had been under cultivation from one month to twelve years. The resistance to fever of the different strains was found to vary; cultures that had been isolated ten and twelve years previously tolerated heat for a longer time than recently isolated cultures. Nevertheless it was found that at a temperature of 41 C. (105.8 F.) 99 per cent of the gonococci were destroyed in from four to five hours, but to destroy the remaining 1 per cent required heating at this temperature for from eleven to twenty-three hours.

When subjected to a temperature of 41.5 C. (106.7 F.) and 42 C. (107.6 F.), 99 per cent of the gonococci were killed in two hours whereas the remaining 1 per cent required heating from seven to twenty hours at 41.5 C. or from five to fifteen hours at 42 C. From these results, Carpenter, Boak, Mucci and Warren concluded that artificial fever might be a valuable aid in the treatment of gonococcic infections.

RESULTS OF TREATMENT

Stimulated by the work of Carpenter, Boak, Mucci and Warren, and by the unpublished observations of Simpson, we undertook to test the method in cases of gonorrhea, both acute and chronic, with or without complicating lesions. Between December 1933 and September 1934 we have undertaken to treat by this method thirty-three patients with gonococcic infections of the genito-urinary tract; that is to say, thirty-three patients were referred for fever therapy. Of these thirty-three patients, four received only one session of treatment and either they did not reappear for treatment or the idea of treating them had to be abandoned for lack of cooperation; these four patients must be excluded from further consideration.

Of the remaining twenty-nine patients, twenty-five completed the treatment and were cured. By cure we mean precisely what is implied by the word cure: complete cessation of urethral discharge, disappearance of symptoms and of gonococci, in spite of repeated examinations.[17] Moreover, these patients have remained free from discharge, symptoms and gonococci for from one to several months, depending on how recently their treatment was completed. Ten of these patients (nine men and one woman) had a complicating acute gonococcic arthritis, and the arthritis also was cured.

In nine of these twenty-five cases the urethral discharge ceased and smears were free from gonococci after the first session of treatment. In four cases the urethral discharge ceased and smears were free from gonococci after the second session of treatment. In three cases the urethral discharge ceased and smears were free from gonococci after the third session of treatment. In two cases the urethral discharge ceased and smears were free from gonococci after the fourth session of treatment. In four cases the urethral discharge and smears were free from gonococci after the fifth session of treatment. In two cases the urethral discharge did not cease and smears did not become negative until the patients had received seven and ten sessions of treatment, respectively. This fact will be commented on later. In one of the twenty-five cases the patient received eight sessions of treatment and was cured, but it is not certain how many sessions he received before the smears became negative.

Of the twenty-nine patients who can be said to have received systematic treatment, four were not cured. One was a woman, aged 18, with acute urethritis. The second was a woman who had a relatively chronic urethritis, with cervicitis, salpingitis, and an acute gonococcic arthritis of the right knee. The third and fourth patients were girls, aged 5 and 8 years, respectively, who had acute gonococcic vaginitis. At the time the first two patients were treated, the only fever chamber available was not air tight, and great difficulty was experienced in inducing a sufficiently high temperature and in maintaining the fever long enough to be effective. Moreover, one of these patients (the first named) did not tolerate the treatment well. Her pulse rate was flighty, and nausea and vomiting supervened at each session of treatment. This relatively unusual complication greatly increased the difficulty of treatment. As for the young girls with acute vaginitis, the condition of both improved; the discharge did not cease completely, however, although each received eight sessions of fever. It is true that, during some sessions, it was impossible to maintain the temperature consistently above 41.1 C. (106 F.), and the early sessions were far from satisfactory. This may have had a great deal to do with our failure to cure these patients with fever alone.

15. Koch, J., and Cohn, A.: Gonokokkeninfektionen, in Kolle, W.; Kraus, R., and Uhlenhuth, P.: Handbuch der pathogenen Mikroorganismen **4**: 705, 1928.

16. Carpenter, C. M.; Boak, Ruth A.; Mucci, L. A., and Warren, S. L.: Studies on the Physiologic Effects of Fever Temperatures, J. Lab. & Clin. Med. **18**: 981-991 (July) 1933.

17. In all cases smears were made and examined each day, except on days that the patients were treated.

From the foregoing it may be seen that all the male patients who cooperated faithfully were cured, whereas for the female patients a cure appears to have been more difficult to obtain. As has been explained, much of this difficulty arose from imperfect insulation of the first fever chamber, with which most of the female patients were treated; but this does not account altogether for the failure to cure all the female patients. With the improved chambers that we now have and with greater experience we are convinced that the cure of a large proportion of female patients can be obtained; we doubt, however, that the percentage of such patients who can be cured can ever attain 100. The nervous system of the average woman is less stable than that of the average man. Probably related to this circumstance is the relative instability of the gastro-intestinal tract of the average woman. The skin of the average woman also is more sensitive; moreover, secondary infection is more common than among men. All these factors tend to make treatment more difficult and less effective.

In spite of these difficulties, however, there is no doubt that a large majority of female patients who have gonococcic infections can be cured by this method in much less time than by the methods heretofore in vogue.

As an example of the possibilities, the following may be of some interest: One day, one of us received a visit from a physician who was accompanied by another man. The physician told the following story: A few weeks previously, the wife of the man who accompanied him had noticed a vaginal discharge which she could not understand and she asked the physician about it, but, not even thinking of the possibility of gonococcic infection, he told her that the discharge was not significant and would probably subside spontaneously. Both husband and wife had always been healthy and had lived regularly. About a week later she again mentioned the subject to the physician, who again regarded the matter as insignificant and did not even trouble to examine the discharge.

A short time afterward, the husband presented himself to the physician and complained of a urethral discharge, smears of which contained an abundance of gonococci. The physician then proceeded to examine smears taken from the wife, and these also contained innumerable gonococci; moreover, on examination, left-sided salpingitis was found. All factors of a clear history indicated that the infection of both patients had been innocently acquired.

Having heard that another patient from the same locality had been cured by the fever method, the physician had come to inquire about it on behalf of his companion and of the companion's wife. They were told that promises of cure could not be made but that previous experience encouraged us to believe that a cure might be possible, whereupon it was decided that the husband would be treated first and, if the treatment should prove successful, his wife could then be given the benefit of the same procedure. Briefly, the husband's urethritis was cured after four sessions of fever. Then the wife, who already had a complicating salpingitis on the left side, also submitted to treatment. Owing to an unusually sensitive skin, a sufficiently high temperature could not be attained during the two initial sessions of fever. After this the skin tolerated a satisfactory degree of temperature, and four additional sessions of treatment were sufficient to cure not only the urethritis but also the salpingitis. Both husband and wife have been perfectly well since then.

TECHNICAL CONSIDERATIONS

How do patients tolerate such treatment? In treating gonococcic infections, the aim is to destroy the infecting organism directly by subjecting it to a sufficiently high temperature for a sufficient length of time. At the outset, it was arbitrarily decided to raise the temperature to between 41.1 C. (106 F.) and 41.7 C. (107 F.) and to maintain it at this level for five consecutive hours. On the average it requires from sixty to ninety minutes, and in some cases even longer, to bring a patient's temperature to 41 C. (105.8 F.), and at the end of a session of fever at this level it requires approximately the same length of time for the temperature to return to normal. The temperature of many patients could be raised more rapidly, but to push the fever too rapidly would be to strain the power of the skin to adapt itself and might result in burns, which should and usually can be avoided. The majority of patients tolerate treatment quite well, and the way patients behave under treatment is an absolute function of the character and temperament of the individual. Persons who are determined to get well as quickly as possible take their sessions of fever without a whimper; some even sing (not from delirium but to while away the time) and smoke during each session. Others begin to ask to be released from the chamber long before the treatment session has been completed. Naturally, five hours at a temperature of from 41.1 C. (106 F.) to 41.7 C. (107 F.) or even a little higher is not only a fairly strenuous cardiovascular functional test but also a thorough test of the character of an individual. Pampered persons, without intestinal fortitude, or persons who do not understand the meaning of self restraint, are bad subjects for fever therapy, and their failure to cooperate often makes effective treatment difficult or impossible.

At first also the treatment sessions were repeated, in cases in which the urethral discharge had ceased after the first session, only when the discharge reappeared. Moreover, when the discharge did not disappear after the first or after subsequent sessions, several days (from three to seven) was then allowed to intervene between sessions. As experience soon showed, it was unwise to allow so many days to elapse between the sessions of fever. Since then we have modified this procedure, and now only two days is allowed to intervene between the different sessions of treatment. In this way, whenever the discharge ceases, whether this is after the first, second or any subsequent session of treatment, it usually does not reappear.

If patients could be treated every day instead of every second or third day, the disease could be cured more rapidly and with even greater certainty; but this is hardly feasible. A temperature of from 41.1 C. (106 F.) to 41.7 C. (107 F.) maintained for from five to six or eight hours taxes the strength of the average individual to a considerable degree. If measures to prevent it were not taken, considerable loss of weight and strength would occur and would probably continue for some days. The loss of weight would result from loss of fluids by perspiration, and the loss of strength would result chiefly from loss of chlorides. This difficulty is largely obviated by causing the patients to drink, during each session of treatment, from 2 to 5 liters of a 0.6 per cent solution of sodium chloride. As a result of this procedure, the weight of the average

patient actually increases during a treatment session, and the incidental fatigue, instead of continuing for days, usually disappears in from twelve to twenty-four hours. To minimize the fatigue further and to make the long sessions more bearable, especially for nervous and apprehensive patients, sedatives are given from time to time. Of these we have found codeine, pentobarbital sodium (nembutal) and sodium amytal the most satisfactory. Dilaudid is not reliable and may give rise to unnecessary complications. Morphine is to be avoided because of its tendency to induce nausea and sometimes vomiting, which may considerably interfere with treatment.

Another significant feature of the treatment as applied in this series of cases was that three patients had to be subjected to seven, ten and twelve sessions of fever, respectively, before the gonococcic infection was cured. This was attributable to two factors: the temperature and the time during which it was maintained. In these particular cases either the temperature was not raised sufficiently or the time during which the fever was maintained was too short; usually the two factors combined to diminish the effectiveness of treatment. In gonococcic infections there is no doubt that the therapeutic efficacy of fever is absolutely a function of the degree of temperature attained and of the time during which an adequate degree of temperature is maintained. Patients vary considerably in the readiness with which their temperature can be elevated and, as a corollary, the temperature of some patients can be raised to any desired degree in much less time than that of other patients whose mechanism of temperature control is much less labile or more resistant to external influences.

When these three patients were treated, the treatment was supervised by a medical assistant who was obliged to work in another service during the latter part of the afternoon. Therefore, if the temperature of a patient was slow to rise, this was not compensated for by extending the total duration of the session; the patients were withdrawn from the fever chamber at a fixed time, regardless of the period during which a temperature between 41.1 C. (106 F.) and 41.7 C. (107 F.) had been maintained. In these particular cases, for the reason given, such a temperature was not maintained for five hours but only for four or even three hours. This is why so many more sessions were required to effect a cure.

This experience caused us to modify the scheme of treatment as it relates to the time factor, which is quite as important as the temperature factor. The present scheme of treatment is to raise the patient's temperature to 41.1 C. (106 F.) and to maintain it between 41.1 C. (106 F.) and 41.7 C. (107 F.) for six hours at each of the two initial sessions of treatment, which are regarded as test sessions. If by this time the urethral discharge has ceased and gonococci have disappeared from smears, one or two additional sessions of fever are given in order to prevent any possibility of recurrence. If the discharge has not ceased after the second session of treatment, however, the subsequent sessions are extended to seven or eight hours, during which a temperature between 41.1 C. (106 F.) and 41.7 C. (107 F.) is maintained as steadily as possible. With this scheme of treatment, more than four sessions should seldom be required to effect a cure.

Of course, an individual who, either because the skin is exceptionally sensitive or because there is a strong natural resistance to fever, cannot be brought to the required degree of temperature, or whose temperature cannot be maintained at this level for a sufficient time, may occasionally be encountered. If, in such cases, the same tendency manifests itself at each of three or four consecutive sessions, a cure will probably not be obtained. Naturally, this depends on the degree of discrepancy between the required maximal temperature and the temperature actually attained and maintained. Such cases, fortunately, are quite exceptional. Not infrequently, at the first session or two, there may be some difficulty in raising the patient's temperature to the proper level. When this is the result of sensitiveness of the skin and an abnormal tendency to local erythema (from excessive accumulation of heat in an area in which the circulation or the distribution of sweat glands may be deficient) the difficulty can generally be overcome by cooling this area with ice or covering it with a bandage. But when the difficulty is the result of a tendency to diffuse erythema from an extensive functional inefficiency of the sudoriferous system, the problem may solve itself. One or two sessions of moderate fever may so increase the functional capacity of the perspiratory mechanism that more effective treatment may subsequently become feasible.

As for the ten cases in which urethritis was complicated by gonococcic arthritis, the inflammatory process subsided quite rapidly. Moreover, the articular inflammation in these cases has not recurred for weeks or months since the patients were treated.

The temperatures mentioned throughout this paper represent rectal temperatures.

As long as the patient's rectal temperature remains below 40 C. (104 F.) the temperature is taken every ten or fifteen minutes, but after the temperature has risen above this level it is taken and recorded every five minutes. Sufficiently accurate recording thermometers have not yet become available, and we have insisted throughout on the careful use of a hand thermometer. This has one important advantage. Recording mechanical thermometers are quite impressive for visitors, but a functional failure might prove disastrous. Moreover, when a nurse is given a dial to watch and is instructed to govern her actions by its indications, her natural tendency is to give her attention to the dial rather than to the patient. We feel, therefore, that the hand method of taking the rectal temperature has advantages which should not be lightly cast aside.

APPARATUS

The treatment in the cases reported has been carried out by means of the air-conditioned fever chamber known as the "Kettering hypertherm," the development of which has been the result of the collaboration of Dr. Walter M. Simpson of the Miami Valley Hospital, Dayton, Ohio, and of Mr. C. F. Kettering, director of the Division of Research, General Motors Corporation, also of Dayton.[18] The chamber consists of a horizontal box, the base or bed of which can be rolled in or out at will. The patient lies on this bed, resting on a comfortable air mattress, which is rolled into the chamber proper, and the chamber is then hermetically closed by means of a sliding vertical panel, through which the head of the patient projects. Thus, when the chamber is closed, the patient's body is within the chamber while the head is outside, resting on a shelf provided for the purpose. At the foot of the chamber, in a special compartment, is the simple machinery that heats and

18. We are indebted to Dr. Simpson and Mr. Kettering for their kindness in placing these fever chambers at our disposal.

humidifies the air. The temperature of the air within the chamber is controlled by a thermostat and can be varied at will. The relative humidity of the air is controlled by a humidistat, and this factor also can be increased or decreased as may be required. By means of a fan, the heated and humidified air is forced between the two layers of the double ceiling of the chamber, down over the patient, and thence back to the special compartment at the foot end of the chamber, through a metal grill in the partition which separates the patient from the mechanism. The column of heated and humidified air is thus made to circulate around the patient about ten times a minute. The patient's body is entirely free within the chamber, and no electrodes or other electrical gadgets of any kind come in contact with the patient at any time. This is one of the chief advantages of this method of fever therapy over any method that involves diathermy or short-wave radiations with their electrodes or condenser plates. Another important advantage is the facility with which the patient's skin can be examined, the rectal temperature taken, and all the physical needs of the patient attended to, throughout a session of treatment. This is made possible by sliding panels on each side of the chamber; these can be opened at any time for the supervising physician to examine the patient's skin or for the specially trained nurse to take the patient's temperature, to change the single blanket that covers the patient when it becomes soaked with perspiration, for the introduction of a bed pan, or for any other purpose. Also, in case of emergency, the chamber can be thrown open and the patient withdrawn in a few seconds.

CONTRAINDICATIONS

In the past, advanced age, cardiac and renal disturbances, arteriosclerosis, pulmonary tuberculosis, and diabetes have repeatedly been mentioned as formal contraindications to fever therapy in general. There is no doubt that old age, organic lesions of heart and kidneys, and arteriosclerosis greatly increase the risk of fever therapy. As for pulmonary tuberculosis, and tuberculous lesions generally, there are reasons for believing that, in selected cases at least, fever therapy may indeed prove a valuable therapeutic procedure. This possibility is now being investigated.

Wilder and others have demonstrated that well controlled diabetes does not preclude even major surgical procedures. For this reason, Wilder felt that diabetes, if under satisfactory clinical control, should not bar a patient from fever therapy if this should otherwise be indicated. Having under his care a man with diabetes who had recently acquired a gonorrheal urethritis, and the diabetes having been under control for some time, Wilder referred him for fever therapy. Needless to say, other contraindicating factors did not exist. After the first session of fever the patient had a reactive flurry, but this subsided rapidly. On the whole, he tolerated the treatment just as well as any other patient and the gonococcic infection was cured. The discharge did not cease and smears continued to show gonococci until after the seventh session of treatment. This was because, at each of the early sessions, the required degree of fever was not maintained long enough; the patient was withdrawn from the chamber after only four hours of maximal fever. If this could have been avoided, and if, from the very start, the required temperature had been maintained for at least five, and preferably six, hours, it is certain that the number of sessions could have been materially reduced. This case is not described in greater detail because Wilder intends to make a complete report of it. It is mentioned here only to bring out the fact that diabetes need not bar a patient from fever therapy, but it is essential that the diabetic manifestations should be under good clinical control and that the patient should be free from other complicating disturbances.

COMMENT

Treatment of this kind requires the constant attention of nurse technicians, who must be carefully selected and specially trained. Just as important, however, such treatment must have the constant supervision of a physician familiar with all the details of the method. By constant attention on the part of the nurse we mean that she must not leave the patient for an instant as long as the patient is in the chamber. If she must absent herself momentarily, her place must be taken by another technician or by the supervising physician. The nurse technicians and the physician on service are not allowed to go out to lunch; lunch is brought to them and is eaten in the service. If fever therapy is conducted in this way, and if the patients subjected to such treatment are carefully selected, only minor complications need be anticipated. Such minor complications include herpetic lesions around the lips and mouth; occasional blisters in skins that are unusually sensitive and that are slow to adapt themselves to a rapid rise in temperature; and muscular tetany, usually limited to the hands and feet but which may sometimes (as in one of our cases) affect the abdominal muscles. This is an uncommon disturbance, is apparently the result of overventilation and disappears almost instantly on administration of carbon dioxide and oxygen; it often abates just as promptly on intravenous injection of 10 cc. of calcium gluconate.

Fever therapy, especially for conditions that require such high temperatures, should preferably be conducted in an institution where the work can be properly organized. There is no reason why any well trained physician could not undertake such treatment. But for a physician to think that he can turn a button in the morning and leave the patient to the tender mercies of a technician, while he goes down town to call on other patients and attend to his usual practice, would be a dangerous fallacy. In most cases perhaps nothing serious would happen, but the physician would never know when, on returning, he would have to face a major calamity, the responsibility for which would rest on him and not on the technician.

SUMMARY AND CONCLUSIONS

Between December 1933 and September 1934, thirty-three patients suffering from simple urethritis or from urethritis complicated by cervicitis, salpingitis or arthritis were referred for fever therapy. Four cases must be excluded because the patients did not return after the first session of fever or because they failed to cooperate and the idea of treating them had to be abandoned.

Of the twenty-nine remaining patients, twenty-five received systematic treatment and were cured.

The average number of sessions of fever required to effect a cure was 5.4. The largest number of sessions required was twelve in one case; this was owing to the fact that, during the early sessions, an adequate degree of fever was not attained or was not maintained long enough. The lowest number of sessions of fever required for cure in any case was three.

Four patients were not cured, probably because the required degree of temperature could not be attained or consistently maintained for a sufficient time.

During the early phase of this work the sessions of fever were repeated only when the urethral discharge reappeared; that is, after a lapse of from three to seven days. Later, only two days was allowed to intervene between sessions.

At first also a rectal temperature between 41.1 C. (106 F.) and 41.7 C. (107 F.) was maintained for five hours in most cases, but in some cases such a degree of fever was not attained or it was not consistently maintained for five hours. This explains why a few patients required as many as seven, ten and in one case even twelve sessions of fever to effect a cure.

Now, the first two sessions are regarded as test sessions, and a temperature between 41.1 C. (106 F.) and 41.7 C. (107 F.) is maintained for six hours. If by that time the urethral discharge continues and gonococci are still found in smears, the duration of subsequent sessions is increased to seven or eight hours. With such a scheme of treatment, more than four sessions of treatment should seldom be required.

The case of a husband and wife, both suffering from gonococcic urethritis, the wife having a complicating unilateral salpingitis, and both husband and wife being cured after four and six sessions of fever, respectively, illustrates the possibilities of the method.

Well controlled diabetes does not contraindicate fever therapy for gonococcic infection or for any other condition for which fever therapy may be indicated. The case of a man who had diabetes, and who was cured by fever therapy, substantiates this conclusion.

When fever therapy is properly carried out, with specially trained nurse technicians in constant attendance, with the constant supervision of a physician familiar with all phases of such treatment, and when the cases are carefully selected, only minor complications need be anticipated. These include herpes labialis, an occasional skin blister, and muscular tetany (hands, feet and sometimes the abdomen), which promptly disappears on administration of carbon dioxide and oxygen or on intravenous injection of calcium gluconate.

As sedatives, codeine, pentobarbital sodium and sodium amytal have been found most satisfactory. Dilaudid is unreliable and may lead to collapse. Morphine should be avoided because of its tendency to induce nausea and sometimes vomiting, which may seriously interfere with an adequate intake of fluids and chloride during treatment.

Fever therapy, especially for conditions requiring a high temperature, should be conducted in an institution where adequate facilities and trained personnel are available. It cannot be carried out in conjunction with other medical practice without increased risk.

The Heating of Tomato Juice.—In very careful experiments made by the late Dr. Grose it was found that four hours heating of tomato juice of natural acidity involved a destruction of 20 per cent of its vitamin B at 100 C. (212 F.); 33 per cent at 110 C. (230 F.); 47 per cent at 120 C. (248 F.); 55 per cent at 130 C. (266 F.). Thus there is no sudden destruction or suddenly accelerated rate of destruction at any particular point; but rather, like most chemical reactions, the reaction by which vitamin B is destroyed under such circumstances runs at a rate which increases gradually with increasing temperature. There may, of course, be further losses if the food is cooked in water (or canned) and the cooking water (or liquid in can) rejected.—Sherman, H. C.: Food and Health, New York, Macmillan Company, 1934.

STUDIES OF VELOCITY AND THE RESPONSE TO INTRAVENOUS INJECTIONS

V. THE APPLICATION OF THE INTRAVENOUS DRIP METHOD TO CHEMOTHERAPY AS ILLUSTRATED BY MASSIVE DOSES OF ARSPHENAMINE IN THE TREATMENT OF EARLY SYPHILIS

LOUIS CHARGIN, M.D.
WILLIAM LEIFER, M.D.
AND
HAROLD THOMAS HYMAN, M.D.
NEW YORK

In chemotherapy the optimum therapeutic result is obtained by the introduction of the specific agent in quantities that suffice to destroy the noxious invader without seriously or permanently injuring the cells of the host. Under controlled conditions, this ideal is approached in animals that have been experimentally infected with syphilis and then promptly and adequately treated with arsphenamine.[1] In human syphilis the problem offers greater difficulties: treatment is delayed, the dosage must be augmented, idiosyncrasies are encountered, there occur technical errors in the administration of the drug, and untoward reactions may follow varying from mild and transitory disturbances to fatal poisoning.

In a previous communication, one of us (Hyman[2]) demonstrated that the "rapid intravenous introduction of pharmacologically active or inert chemicals, drugs and biologic fluids may give rise to alarming and, at times, fatal symptoms"—a syndrome which was termed "speed shock." It was further shown that the "slow intravenous introduction of these same agents and even highly toxic substances (anaphylatoxin, histamine) could be accomplished with impunity by means of the intravenous drip." These results made it necessary to reinvestigate the specific toxicity of many substances. If untoward reactions, in part at least, were technical and hence preventable, potent therapeutic agents might be administered, by means of the intravenous drip, in doses far greater than at present employed, and this without serious damage to the cells of the host. The present study deals with such an investigation, as suggested by Chargin, and it has for its purpose an intravenous drip of massive doses of arsphenamine in the treatment of early syphilis, approximating the ideal of a "sterilisatio magna."[3]

TECHNIC

The drip was set up in the manner previously described.[4] Dextrose in 5 per cent solution was administered by the usual gravity method at a rate of 100 cc.

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From the Department of Medicine, Service of Dr. George Baehr; Department of Dermatology, Service of Dr. Isadore Rosen, the Mount Sinai Hospital, and the Division of Venereal Disease, Department of Health, New York City.

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per hour. At the end of the hour there was added a solution of 0.1 Gm. of neoarsphenamine dissolved in 50 cc. of 5 per cent dextrose solution. During the succeeding hour the dextrose was given again and this in turn was followed by the arsphenamine until the total daily dosage had been administered. Thus in a period of fifteen hours a patient might receive 1,500 cc. of 5 per cent dextrose and 1 Gm. of neoarsphenamine. The treatment was usually started at 8 or 9 a. m. and was continued throughout the day, the needle remaining in situ. The patients were kept in bed. A semisolid diet, rich in carbohydrates, was ordered and this, together with the intravenous dextrose, served to protect the liver from damage by the arsenic.

CHOICE OF MATERIAL

Only male patients in good physical condition were chosen for this study, and all were suffering from early syphilis. One patient presented himself in the seronegative primary stage, while the remainder had infections not older than three months. Consequently the clinical manifestations were limited to the chancre or secondary eruptions or both.

MASSIVE DOSAGE OF NEOARSPHENAMINE IN THE TREATMENT OF EARLY SYPHILIS

The twenty-five patients on whom we shall report received almost 100 Gm. of neoarsphenamine, or an average of 4 Gm. per patient (table 1). This dosage was usually administered over a period of five days. The daily dosage averaged 0.8 Gm. of neoarsphenamine or 160 mg. of arsenic. In the majority of instances 0.5 Gm. was administered on the first day in order to test out the reaction of the patient to the drug. On succeeding days the usual dose was 1 Gm., but in some instances in which for technical reasons the drip was removed, a lesser amount was given. In a few instances (case 16) as much as 1.3 Gm. was administered daily.

The use of the so-called massive doses of arsenic, especially in the treatment of early syphilis, had long since been employed by Scholtz,[5] Pollitzer[6] and more recently by Schreus.

Scholtz[5] administered, in divided doses, over a period of twenty-four hours, a total dosage of from 0.85 to 1.0 Gm. These injections were given at 8 a. m. and 2 p. m. of the first day and at 8 a. m. the following morning. Pollitzer[6] administered, on three successive mornings, daily doses calculated on the basis of body weight, giving approximately 0.1 Gm. of arsphenamine for each 25 to 30 pounds (11.3 to 13.6 Kg.) of body weight. The total dose would accordingly vary between 1.2 and 1.35 Gm. Schreus[7] and Bernstein gave a total of from 1.2 to 1.5 Gm. of neoarsphenamine in three injections in a single day and repeated this dosage every week for five or six weeks until a total amount of from 6 to 9 Gm. was administered.

In average therapy the single dose of neoarsphenamine varies from 0.3 to 0.6 Gm. (a minimum of 0.1 and a maximum of 0.9 Gm.). This dosage is usually administered at intervals of from five to seven days and ordinarily there are from eight to ten injections in a series, so that a total of approximately 5 Gm. of neoarsphenamine or its equivalent given over a period of from six weeks to three months constitutes an average course. By contrast, we endeavored to administer the entire amount of an average course over a period of a few days.

The Cooperative Clinical Group,[8] by way of comparison, administers from 3 to 3.5 Gm. of arsphenamine in the course of six weeks. They suggest from 0.3 to 0.6 Gm. (0.1 Gm. per twenty-five pounds of body weight) on the first, fifth and tenth days, and then 0.4 Gm. at weekly intervals for four doses or until six weeks has elapsed. Our dosage given over a period of five to six days thus exceeds the amount that this group gives over a period of as many weeks.

From the standpoint of the cure of the syphilis, the advantages of the present scheme appear to be self evident. It affords an approach to Ehrlich's original conception of a sterilizatio magna, in that it makes possible the massing of the dose of arsphenamine at a time when it can exert its most potent action.

TABLE 1.—*Daily and Total Dosage of Neoarsphenamine in Grams*

Case	Name	First Day	Second Day	Third Day	Fourth Day	Fifth Day	Sixth Day	Total Days	Total Dose
1	D. M.	0.5	0.4	0.9	0.6	...	...	4	2.4
2	W. S.	0.6	0.9	1.0	0.4	...	...	4	2.9
3	G. S.	0.5	1.0	1.0	1.0	...	...	4	3.5
4	L. S.	0.5	1.0	1.0	0.8	...	...	4	3.3
5	W. C.	0.6	1.0	...	0.9	0.7	...	4-5	3.2
6	O. S.	0.3	1.0	0.6	1.0	...	...	4	2.9
7	J. S.	0.6	1.0	1.0	1.0	0.4	...	5	4.0
8	J. C.	0.7	1.0	1.0	0.9	1.0	...	5	4.6
9	A. S.	0.6	1.2	1.2	0.9	0.8	...	5	4.7
10	J. D.	0.9	0.8	1.0	0.9	1.2	...	5	4.8
11	W. C.	0.6	1.1	1.1	1.2	0.7	...	5	4.7
12	E. O.	0.6	1.1	1.2	0.8	1.1	...	5	4.8
13	A. F.	0.4	1.1	0.6	1.2	0.8	0.4	6	4.5
14	C. R.	0.6	1.2	1.1	0.7	...	...	4	3.6
15	H. L.	1.2	1.2	1.3	1.3	...	...	4	5.0
16	L. T.	0.6	1.3	1.3	1.25	...	...	4	4.45
17	J. B.	0.3	0.9	1.3	1.1	0.8	...	5	4.4
18	E. R.	0.8	1.1	1.1	0.9	...	...	4	3.9
19	G. C.	0.9	1.0	1.0	1.0	0.6	...	5	4.5
20	R. R.	0.9	1.0	1.0	...	0.5	...	4-5	3.4
21	S. S.	0.7	1.0	1.0	0.9	0.9	...	5	4.5
22	H. B.	1.0	0.5	0.7	...	1.0	1.0	5-6	4.2
23	B. S.	0.6	1.0	0.3	1.0	1.0	0.1	6	4.0
24	J. K.	0.6	1.0	...	1.0	...	0.2	4-6	2.8
25	T. H.	0.9	1.0	0.8	1.0	0.6	...	5	4.3

THE EFFECT OF MASSIVE THERAPY ON THE CLINICAL MANIFESTATIONS OF EARLY SYPHILIS

The effect of these massive doses on the clinical manifestations of the syphilitic infection was specific, as was to be expected. Chancres and secondary eruptions healed rapidly, those with markedly infiltrated lesions less rapidly than those less infiltrated. In most of the instances in which secondary eruptions were present a Herxheimer reaction became manifest about twenty-four hours after therapy was instituted, lasted until the following day, and then gradually faded out. Almost invariably there was an accompanying rise in temperature, varying between 101.5 and 104 F. and reaching its height in twenty-four hours. It is of interest to observe and important to stress that in those cases in which no secondary eruption was present the temperature frequently rose exactly as in the other group of cases. This temperature rise may be regarded as a type of "Herxheimer" reaction.

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EFFECT OF MASSIVE DOSES OF ARSPHENAMINE ON SEROLOGIC TESTS

In a paper in 1921, Chargin [9] expressed the view that the serology is the most valuable guide for determining the efficacy of any method of treatment in early syphilis. This dictum still holds true, and while seronegativity does not necessarily mean "cure," it is the most tangible yardstick that can be employed in any discussion of the efficacy of treatment in syphilis.

The serologic results in our twenty-five patients may be grouped in three categories: In the first group we include six patients (5, 10, 13, 22, 24 and 25), who were lost from observation before a change in the serologic reaction could be anticipated (table 2). One of these patients disappeared after the first week, one after the third week, one after the fourth week, two after the fifth week, and one after the ninth week. In all these instances the Wassermann reaction was still 4 plus.

The remaining nineteen patients were observed beyond the critical period of three months. These patients may be subdivided in the last two categories: the seropositive and the seronegative groups.

The seropositive group contains but one individual, patient 6, who was still positive in the sixteenth week. This man, who was one of the earlier in the series, received but 2.9 Gm. of the drug.

The seronegative group includes eighteen of the group of nineteen patients who were followed for more than three months. The period for the clearing serologically averaged ten weeks. In two instances (cases 2 and 20) a negative test was not obtained for more than three months. Patient 20 was not seen between the second and the sixteenth week. Patient 2 received only 2.9 Gm. of the drug, as he was one of the earlier patients. It is necessary also to comment on patient 15. In the seventeenth week, though he had no clinical manifestations of syphilis, his Wassermann reaction was 2 plus. We have included him in the seronegative group with this explanation. Subsequently, his test became negative also (table 2).

In his classic survey of the subject, Moore [10] states that 52.6 per cent of the cases of early syphilis become seronegative on or before the end of the third month. The Cooperative Clinical Group,[8] treating their seropositive primary and secondary cases with bismuth and mercury compounds as well as with arsenic, give, as average results, a seronegative serum in slightly more than 50 per cent, and they state that the best results varied between 61 and 82 per cent. By way of comparison, and realizing the limitations of so small a group, we cannot refrain from pointing out that eighteen of the nineteen patients that we followed, or slightly less than 95 per cent, attained seronegativity in a period averaging less than three months, though they received neither of the adjuvant heavy metals.

TABLE 2.—*Results of Wassermann Test*

Case	Name	Total Dose Neo-arsphenamine	Wassermann Before Treatment	1st Wk.	2d Wk.	3d Wk.	4th Wk.	5th Wk.	6th Wk.	7th Wk.	8th Wk.	9th Wk.	10th Wk.	11th Wk.	12th Wk.	13th Wk.	14th Wk.	15th Wk.	16th Wk.	Comment
1	D. M.	2.4	4	..	4	4	4	4	4	..	1	Neg.	..	..	Neg.	..	..	..	..	
2	W. S.	2.9	4	..	..	4	..	4	4	..	4	4	4	4	4	..	..	..	3	
3	G. S.	3.5	4	..	4	4	4	..	4	3	..	±	Neg.	..	..	..	..	..	Neg.	4 months later negative
4	*L. S.	3.3	4	..	4	4	..	4	..	±	Neg.	..	..	..	..	..	..	Neg.	..	5, 6, 7 and 8 mos. later Wassermann negative
5	W. C.	3.2	4	..	..	4	4	4	4	4	4	4	Lost							
6	O. S.	2.9	3	..	3	4	4	3	..	..	4	..	4	..	4	..	..	..	4	Lost
7	*J. S.	4.0	4	..	4	4	4	3	2	1	Neg.	..	..	Neg.	..	..	..	..	Neg.	3 months later negative
8	J. C.	4.6	4	..	4	4	4	4	3	..	a.c.	Neg.	..	Neg.	..	..	..	..	..	3 and 5 months later negative
9	*A. S.	4.7	4	..	4	4	..	..	..	4	3	Neg.	..	..	..	..	..	..	..	
10	J. D.	4.8	4	Lost																
11	*W. C.	4.7	Neg.	..	4	4	..	2	..	..	Neg.	..	Neg.	..	..	..	..	..	..	
12	E. O.	4.8	4	..	..	4	4	..	4	..	..	2	..	Neg.	..	..	..	..	..	4 months later negative
13	A. F.	4.5	4	4	4	3	Lost													
14	C. R.	3.6	4	4	4	4	4	..	4	..	4	..	2	2	±	Neg.	..	..	..	2 and 6 months later negative
15	H. L.	5.0	4	4	..	4	..	..	4	4	3	4	4	4	4	..	4	..	4	13 positive Wassermann until 7 months later, then Wassermann negative
16	*L. T.	4.45	4	..	2	..	2	Neg.	Neg.	..	..	..	..	..	..	..	..	..	..	
17	*J. B.	4.4	1	..	2	Neg.	±	..	±	Neg.	..	..	Neg.	..	..	..	..	..	..	
18	E. R.	3.9	4	4	4	..	4	..	4	3	..	3	1	Neg.	..	..	..	..	..	3 and 4 months later negative
19	G. C.	4.5	4	4	4	..	4	Neg.	3	1	Neg.	..	..	..	..	..	..	..	..	
20	R. R.	3.4	4	4	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4 months later negative
21	S. S.	4.5	4	..	4	4	..	4	..	4	4	Neg.	Neg.	Neg.	..	Neg.	..	..	Neg.	
22	M. B.	4.2	4	Lost																
23	B. S.	4.0	4	4	4	4	4	4	4	1	Neg.	..	..	..	..	..	..	..	..	
24	*J. K.	2.8	4	4	4	4	4	Lost												
25	T. H.	4.3	4	4	4	4	..	4	Lost											

* Dark field examination of the primary sore in these cases showed presence of Spirochaeta pallida.

THE TOXICITY OF THE ARSPHENAMINE WHEN ADMINISTERED BY THE MASSIVE METHOD

Pain in and about the site of injection was present at one time or another in every instance. The pain varied considerably in degree and duration. It was present in spite of the fact that no perivenous infiltration occurred in any of the cases. A mild and self-limited phlebitis occurred only three times. In only one instance was the pain sufficiently severe to demand the temporary discontinuance of the drip. Usually it was easily controlled by the administration of acetylsalicylic acid with or without codeine phosphate. As this type of pain occurs fairly frequently with drip therapy when

9. Chargin, Louis: Antisyphilitic Therapy: A Comparative Study of Some Intensive Methods, J. A. M. A. **76**: 1154 (April 23) 1921.

10. Moore, J. E.: The Modern Treatment of Syphilis, Baltimore, Charles C. Thomas, 1933, p. 188, table 7.

dextrose alone or saline solution is used, it cannot be attributed to the arsenic employed.

NITRITOID CRISES

No instance of nitritoid reaction was recorded in this series, though it is the general experience that such reactions occur in from 1 to 2 per cent of all cases in which other methods of administration have been employed.[11] This supports our earlier work [2] in which we stated our conviction that these nitritoid crises, as well as the so-called anaphylactoid phenomena, were nonspecific and probably identical with "speed shock."

FEBRILE REACTIONS

Temperature elevation occurred within the course of the first thirty-six hours in 80 per cent of the patients. In five of those who had secondary skin eruptions a typical Herxheimer skin reaction also occurred, reaching its height twenty-four hours after therapy. The cutaneous reaction persisted until the following day. The average temperature approximated 101.5 F., but in several instances it exceeded 103. The temperature elevation bore no relationship to the eruption, either in its extent or in its character. Whenever the temperature rose beyond 101.5 F. there were usually accompanying symptoms, such as malaise, nausea, vomiting and anorexia. In such instances, treatment was temporarily suspended. Usually within twelve hours after the cessation of drip therapy the temperature fell to normal, and treatment could be resumed without further interruption. In only four instances was it necessary to lose a complete day of therapy.

Secondary temperature reactions occurred in 68 per cent of the cases, and these were markedly irregular both in extent and in the day of appearance as compared with the Herxheimer temperature. The secondary temperature elevations approximated 102, though in one instance the temperature rose to 105.6. On interruption of treatment the temperature dropped to normal in a few hours, and only rarely was there any cause for alarm.

Febrile reactions also occur in patients treated by the usual ambulatory methods.

SYSTEMIC REACTIONS

General systemic reactions were not very severe in character and necessitated temporary cessation of treatment in only a small number of instances. Chief among these symptoms were headache, nausea and vomiting, which occurred in twelve (48 per cent) of the group. Abdominal cramps occurred in eight (32 per cent) of the patients, and varied in severity, but were never sufficiently severe to require interruption of the treatment. Among the other general symptoms observed were loss of appetite in two (8 per cent); chilliness in five (20 per cent), and marked sweating in four (16 per cent). Two of the patients, or 8 per cent, complained of inordinate weakness. These symptoms are often enough encountered in all types of arsenotherapy.

SKIN REACTION

The cutaneous by-effects, which were eight in number in our series, were remarkably mild in type. They were entirely of the exanthematous variety, six being scarlatiniform in character, one urticarial and one morbilliform. In five the eruption appeared at or immediately after the termination of treatment and in three while the patient was still under treatment. In none did the eruption last longer than three days. There was only slight itching and no desquamation. In the three in which eruption developed while under treatment the injections were immediately stopped until the eruption disappeared. In two of the latter the eruption reappeared when treatment was resumed, but again it was evanescent in character. No eruption of the eczematoid variety was observed and no further skin outbreak of any type was seen during the period of observation, which in many cases is now longer than five months.

TABLE 3.—*Daily and Total Elimination of Arsenic in the Urine*

Case	Name	Age	First Day, Mg.	Second Day, Mg.	Third Day, Mg.	Fourth Day, Mg.	Fifth Day, Mg.	Sixth Day, Mg.	Seventh Day, Mg.	Total Neoarsphenamine, Gm.	Arsenic Content of Neoarsphenamine, Mg.	Total Arsenic Elimination, Mg.	Per Cent Elimination
1	D. M.	..	25.5	38.7	24.1	46.5	....	....	....	2.4	480.0	134.5	32.0
2	W. S.	..	17.7	28.3	40.8	7.3	....	....	....	2.9	580.0	94.0	16.2
3	G. S.	..	8.9	37.5	17.7	9.5	4.1	....	....	3.5	700.0	77.0	11.0
4	L. S.	..	8.7	40.1	34.7	23.4	7.7	....	....	3.3	660.0	114.0	17.8
5	W. C.	34	14.6	44.4	19.1	26.8	29.9	6.6	....	3.2	640.0	140.5	21.9
6	O. S.	42	10.5	52.1	29.5	76.0	6.5	....	....	2.9	580.0	174.5	30.0
7	J. S.	23	23.6	35.3	63.7	31.0	13.1	....	....	4.0	800.0	166.5	20.8
8	J. C.	37	37.5	24.9	18.9	30.1	36.8	....	....	4.6	920.0	147.0	15.9
9	A. S.	31	3.8	55.9	70.6	14.6	24.1	....	....	4.7	940.0	168.0	17.8
10	J. D.	42	20.3	32.3	38.6	31.8	32.2	....	....	4.8	960.0	155.0	16.1
11	W. C.	26	17.6	26.6	33.6	63.8	*	....	....	4.7*	740.0	141.0	19.0
12	E. O.	28	16.5	22.0	46.3	24.2	36.2	....	....	4.8	960.0	145.0	15.1
13	A. F.	21	8.3	27.3	53.3	41.8	35.4	37.1	....	4.5	900.0	203.5	22.6
14	C. R.	18	12.6	25.1	32.5	7.2	....	....	....	3.6	720.0	77.0	10.6
15	H. L.	29	27.3	69.5	40.3	31.8	....	....	....	5.0	1,000.0	169.0	16.9
16	L. T.	35	21.8	32.6	39.6	33.8	8.6	....	....	4.45	890.0	135.5	15.2
17	J. B.	28	11.1	34.6	31.1	41.9	19.0	....	....	4.4	850.0	137.7	16.2
18	E. R.	25	45.3	116.1	55.2	37.1	23.2	5.3	8.1	3.9	780.0	290.3	37.2
19	G. C.	29	27.3	92.3	11.5	44.8	37.2	....	....	4.5	900.0	213.1	23.6
20	R. R.	27	10.1	64.3	40.7	11.0	24.2	....	....	3.4	680.0	150.3	22.1
21	S. S.	45	37.7	54.1	30.4	21.7	37.0	....	....	4.5	900.0	180.9	20.1
22	H. B.	33	28.3	30.0	46.8	1.6	61.9	58.3	....	4.2	840.0	226.9	27.0
23	B. S.	..	57.5	29.8	12.8	28.6	69.2	26.3	....	4.0	800.0	224.2	28.0
24	J. K.	30	25.4	58.8	3.3	52.4	8.3	18.7	.. .	2.8	560.0	166.9	29.8

* Last urine specimen lost, so determination is made on dosage up to this point.

CLINICAL EVIDENCES OF LIVER DAMAGE

Not a single instance of jaundice occurred, either during treatment or during the ensuing period of observation. Bile was never found in any urine specimen and the icteric index showed no elevation after completion of the course.

POLYNEURITIS

Polyneuritis was observed in eight cases (32 per cent). It was moderately severe in two instances in which there were muscle pains and paresthesias in the

11. Schamberg, J. F., and Wright, C. S.: Treatment of Syphilis, New York, D. Appleton & Co., 1932, p. 243.

hands and feet, chiefly the latter. The symptoms appeared after the termination of treatment, usually within a few days, and persisted in the two severe cases for a period of six weeks. The condition was less marked in the other six cases and consisted chiefly of paresthesias, much milder in character and lasting less than three weeks. No relationship existed between the onset of polyneuritis and the quantitative arsenic elimination in the urine of these patients (table 3).

Because polyneuritis is more frequently associated with neoarsphenamine, we plan to employ arsphenamine in a future study.

LATE PARENCHYMATOUS DEGENERATION

The most dreaded complications of arsenotherapy are the severe late intoxications, including the eczematoid and exfoliative dermatitides, parenchymatous degeneration of the liver and kidneys, and peripheral polyneuritis of a severe and lasting nature. To date we have not encountered a single instance of any of these untoward manifestations.

THE URINARY EXCRETION OF ARSENIC

Under the direction of Dr. Sobotka of the Chemistry Laboratories of the Mount Sinai Hospital, Dr. Leifer studied the urinary excretion of arsenic in all our patients. The chemical procedure used was a slight modification of the Green [12] iodometric microtitration. It would have been highly important to study the fecal excretion as well, but time did not permit.

Estimating that neoarsphenamine contains 20 per cent of arsenic, we concluded that the average urinary excretion was 21.1 per cent. The results varied between 10.6 and 37.2 per cent. In only two instances did the total elimination fall below 15 per cent (table 3).

The main channel of excretion of arsenic is unquestionably the feces. Mathieu [13] found that the fecal arsenic excretion was approximately 2.5 times that of the urine. Clausen and Jeans [14] reported it to be five times as great, and Underhill and Davis [15] showed that the fecal elimination is considerably higher than the urinary excretion.

The figures of urinary excretion alone, consequently, serve only as an index, and the average figure of 21.1 per cent may be taken to mean only that the total elimination was probably proceeding satisfactorily in amount and rate.

There was no apparent relationship between the amount of urine excreted and its arsenic content. In no instance did there occur any suppression of or interference with urinary function. The daily urine specimens showed no renal irritation of any consequence except for the occasional and transitory presence of minor traces of albumin. In many instances the urinary output was voluminous, reaching from 5,000 to 6,000 cc. in twenty-four hours, probably because of the diuretic action of the intravenous dextrose.

In twenty-two cases the blood urea was determined before and after the course of treatment. In only one instance was there any evidence of nitrogen retention. The blood bilirubin (icterus index) similarly was normal throughout the course of observation.

12. Green, H. H.: South African J. Sc. **11**: 72, 1918.
13. Mathieu, L.: Rev. méd. de l'est. **50**: 713, 1922.
14. Clausen, S. W., and Jeans, P. C.: The Distribution and Excretion of Arsenic After Intravenous Administration of Arsphenamine in Children, Am. J. Syph. **6**: 556 (July) 1922.
15. Underhill, F. P., and Davis, S. H.: The Excretion of Arsenic After Serial Administration of Arsphenamine and Neoarsphenamine, Arch. Dermat. & Syph. **5**: 40 (Jan.) 1922.

COMMENT

Our main object in this presentation is a consideration of the intravenous drip as a method of introducing massive doses of chemotherapeutic agents. We believe that we have demonstrated the possibility of administering truly colossal doses of an effective chemical agent without seriously or permanently damaging the cells of the host. The untoward symptoms that we have noted are not sufficient to deter us from further studies along these lines. It would be a great blunder, however, to employ this method under other than ideal conditions, for serious harm and even death might follow an uncontrolled popularization of our method. It is clearly to be understood that this is a report of an experiment, and that we regard the method as still in the experimental stage and by no means ripe as yet for clinical trial except under ideal institutional conditions.

Aside from the obvious economic advantages to the patient and to the community of an abbreviated and more concentrated therapeutic procedure, the work has a wider public health significance. In the recent article by the members of the Cooperative Clinical Group [8] under the auspices of the United States Public Health Service and sponsored by the League of Nations Health Organization, it was stated that "the aim in early syphilis may be crisply defined as, first, the prevention of transmission by treatment and, secondly, the individual cure."

Viewed from the point of view of public health, the method has the advantage of requiring institutionalization of the patient during the florid and infective stage of the disease. Under the present ambulatory form of treatment the patient is sent back to mingle with the community during the height of his infectivity, a practice not followed in any other infectious disease. Such a type of management, from the point of view of the community, would be analogous to administering diphtheria antitoxin to a stricken child in an outpatient department and then permitting that child to mingle with the community while the throat cultures were still positive and while the disease was still in its infective stage.

The five days of hospitalization necessitated by the massive dose therapy should afford a maximum amount of protection to the community by the strict isolation of the patient during the greatest period of infectivity. The concentration of therapy within five days will probably reduce the period of infectivity very markedly.

The Cooperative Clinical Group stresses that none of its patients were treated with arsenic alone. Our omission of mercury and bismuth compounds in the treatment of this small group was intentional and was done solely with the idea of executing an uncomplicated experiment. In our future work we plan to give our patients the benefit of combined therapy, and it is fair to assume that even more striking results should be obtained.

SUMMARY

Conscious of the fact that our experiences are extremely limited, we do not wish to stress the comparative figures other than to state that the method suggests a means of control of early syphilis from the point of view of public health and from that of the individual patient, which would warrant further and more extensive clinical trial. Quite aside from the discussion of the treatment of syphilis, it is our belief that these experiments open a new and wide field in

chemotherapy. We have demonstrated that it is possible by means of the intravenous drip to administer colossal doses of an effective chemotherapeutic agent without seriously or permanently damaging the cells of the host. There is no good reason why this technic cannot be used in many other invasions of the host by living substances.

1 West Eighty-Fifth Street—286 West Eighty-Sixth Street —940 Park Avenue.

THE EFFECTS OF HYPERPYREXIA PRODUCED BY RADIANT HEAT IN EARLY SYPHILIS

WITH A DESCRIPTION OF A SIMPLE METHOD OF PRODUCING HYPERPYREXIA

NORMAN N. EPSTEIN, M.D.
AND
MAURICE COHEN, M.D.
SAN FRANCISCO

The application of heat in various ways for the production of an artificial fever has been employed since very early times, and by many races, for the treatment of human disease. However, it has only been during the past fifteen years that hyperpyrexia as a therapeutic measure has been critically studied. Its use in the treatment of syphilis of the central nervous system has become an established practice, and in many instances strikingly beneficial results have been obtained in which chemotherapy alone had failed to arrest the disease. Increasing experience has eliminated much of the danger of the procedure, and the introduction of simple methods of elevating body temperature has increased its availability.

Since Wagner von Jauregg's [1] original report in 1918 on the use of malaria in the treatment of dementia paralytica, a number of other methods of inducing hyperpyrexia have been introduced. Among these are inoculation with the parasites of relapsing fever and rat-bite fever, the injection of foreign proteins such as a mixed typhoid-paratyphoid vaccine, the intramuscular injection of sulphur in oil, and certain physical methods such as hot baths, heat cabinets, the electric blanket, diathermy and radiothermy. The therapeutic results obtained with many of these methods have been similar. Since the effect common to all these is the elevation of body temperature, and because the beneficial results are often dependent on the degree of fever obtained, it is generally felt that the hyperpyrexia is the important factor in the treatment rather than the manner in which it is produced.

The present report is concerned with the effects of general hyperpyrexia in early syphilis, with particular reference to the dark field examinations, the clinical course of early syphilitic lesions, and the changes in the serologic reactions. The problem was undertaken because of the brilliant results obtained by fever therapy in late syphilis involving the central nervous system and because of the known susceptibility of Spirochaeta pallida to high temperatures. It was thought that, if the temperature of all the tissues of the human body could be elevated to the thermal death point of the spirochetes for a sufficient length of time, a complete sterilization of these organisms could be accomplished.

During the course of this work a simplified method of producing artificial fever was developed. The technic of this procedure will also be reported here.

REVIEW OF THE LITERATURE

Animal and In Vitro Experimentation.—Weichbrodt and Jahnel [2] in 1919 showed that scrotal syphilitic chancres in rabbits healed more rapidly than usually if the animals were placed at frequent intervals in an incubator heated to 41 C. for half-hour periods.

Schamberg and Rule [3] in 1926 reported that rabbits could be prevented from developing syphilis by a series of eleven hot baths on consecutive days in which the animals' temperature was raised 2.22 degrees C. (4 F.), provided the baths were given within four days after intratesticular injection of Spirochaeta pallida. In 1927 they were able to cure two rabbits with primary testicular sores by a series of hot baths in which the animals' temperatures were maintained at from 40.7 C. (105.2 F.) to 42.8 C. (108.9 F.) for from fifteen to twenty minutes. They were also able to cause the healing of a secondary syphilitic lesion on the foot of a rabbit by fifteen hot baths. In 1928 these authors [4] showed that Spirochaeta pallida, heated in vitro at 41 C. (105.8 F.) for one hour, was no longer capable of producing syphilis in rabbits.

Frazier,[5] experimenting with rabbits and using hot baths, noted a definite inhibition of the clinical progress of a syphilitic infection when the animals' temperatures were elevated to from 41.2 C. (106.2 F.) to 42.8 C. (110.6 F.), but no effect when the temperatures were kept between 39.7 C. (103.5 F.) and 41.1 C. (106 F.) for twenty minutes.

Laps [6] found that temperatures of 40.2 C. (104.3 F.) for eighty-five minutes, or 40 C. (104 F.) for ninety-five minutes were optimum for preventing syphilitic infections in rabbits.

Carpenter, Boak and Warren [7] were able to render syphilitic lesions in rabbits sterile of Spirochaeta pallida by multiple unsustained fevers of from 41 C. (105.8 F.) to 42 C. (107.6 F.), produced by radiothermy. They also found that one febrile period of six hours at from 41.5 C. (106.7 F.) to 42 C. (107.6 F.) also destroyed the spirochetes. In vitro, they demonstrated that the thermal death-point of Spirochaeta pallida was 42 C. (106.7 F.) sustained for one hour, 41 C.

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From the Department of Dermatology and Syphilology of the Mount Zion Hospital, San Francisco, with the cooperation of the San Francisco Board of Health and the Division of Dermatology of the Department of Medicine of the University of California Medical School.

1. Wagner von Jauregg, Julius: Ueber Einkwirkung der Malaria auf die progressive Paralyse, Phys. Neurol. Wchnschr. **20**: 132 (Aug. 31) 1918.

2. Weichbrodt, R., and Jahnel, F.: Einflüss höher Körpertemperaturen auf die Spirochäten und Krankheitverscheinungen der Syphilis in Tierexperiment, Deutsche med. Wchnschr. **45**: 483 (May) 1919.

3. Schamberg, J. F., and Rule, Anna M.: Studies on the Therapeutic Effects of Fever in Experimental Rabbit Syphilis, Arch. Dermat. & Syph. **14**: 243 (Sept.) 1926.

4. Schamberg, J. F., and Rule, Anna M.: The Effect of Extremely Hot Baths in Experimental Syphilis, Arch. Dermat. & Syph. **17**: 322 (March) 1928.

5. Frazier, C. N.: Effect of Elevation of Body Temperature on the Course of Experimental Syphilis in the Rabbit, Arch. Dermat. & Syph. **16**: 445 (Oct.) 1927.

6. Laps, A.: Influence of Temperatures on the Development of Primary Lesions and the Effect of Heat in the General Treatment of Syphilis, Med. contemp., Lisbon **47**: 395, 1929; mentioned by Bessemans and Thiry.[33]

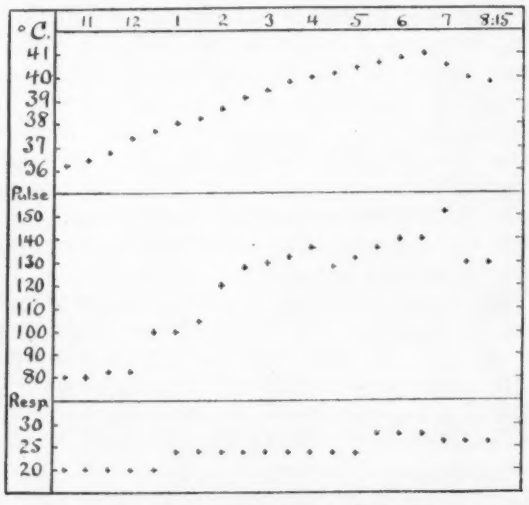
7. Carpenter, C. M.; Boak, R. A., and Warren, S. S.: The Healing of Experimental Syphilitic Lesions in Rabbits by Short Wave Fevers, J. Exper. Med. **56**: 751 (Nov.) 1932. Boak, R. A.; Carpenter, C. M., and Warren, S. S.: The Thermal Death Time of Treponema Pallidum in Vitro, with Special Reference to Fever Temperatures, ibid. **56**: 741 (Nov.) 1932.

(105.8 F.) for two hours, 40 C. (104 F.) for three hours, and 39 C. (102.2 F.) for five hours.

Kolmer and Rule [8] showed that, if rabbits were inoculated intratesticularly with Spirochaeta pallida four days prior to complete immersion in water at 45 C. (113 F.) for twenty minutes daily for fifteen days, the testicular infection was prevented and the inguinal lymphatic glands became sterile. If the same procedure was followed, with the exception that the testicles were kept out of the water, active testicular lesions developed. This indicates that the effect of the elevation of the temperature was mainly local in these experiments.

It is clear from the animal experimentation and the in vitro studies reported that Spirochaeta pallida can be destroyed at temperatures that may be induced in man with safety. Two factors are of importance: the height of the temperature within the tissues, and the duration of time that this is maintained.

Clinical Studies.—The first clinical studies on the effect of hyperpyrexia produced by physical means on syphilis in human beings were done by Schamberg and Tseng [9] in 1927. They treated fourteen patients, among



Temperature chart with the blanket method.

whom were four cases of secondary syphilis, with a series of hot baths. The cutaneous manifestations cleared promptly. No dark field examinations were reported. They state, however, that no definite conclusions could be drawn from this work but suggested that hyperpyrexia as an adjunct to other methods might prove of therapeutic aid.

Between the years 1925 and 1929, Kerl [10] observed 1,600 cases of early syphilis treated with combined arsenic, bismuth and malarial therapy. He concluded that malarial therapy was of little curative value in early syphilis when the infection was of one or two years' duration, but that it was of definite value in the treatment of late secondary syphilis.

Kemp and Stokes [11] in 1929 stated that fever therapy alone will cause involution of primary and secondary manifestations of syphilis but is markedly inferior to arsphenamine or bismuth compounds.

Neymann and Osborne [12] were unsuccessful in treating primary syphilis by means of hyperpyrexia produced by diathermy.

Bessemans and Thiry,[13] in an exhaustive report in June 1933, studied the effect of local heat produced by means of hot water baths and diathermy on the lesions of primary and secondary syphilis in man. They recorded the tissue temperature at the base of the lesions by means of a thermo-electric needle. The therapeutic response was dependent on the height and the duration of the temperature obtained. It required a tissue temperature of 42 C. for one hour, or 40 C. for two hours, to render the spirochetes present immotile and avirulent. They showed that the primary and secondary lesions so treated involuted promptly, while those which were not heated progressed in the usual manner.

TECHNIC OF INDUCING HYPERPYREXIA

In the series of cases reported here, hyperpyrexia was induced by means of a specially constructed, electrically controlled heat cabinet, in which an infra-red element was the source of heat.[14] The temperature within the cabinet was maintained between 130 and 160 F., and the humidity was increased by a container of water at the bottom of the cabinet. The patient, without any special preparation, was placed in the cabinet with the entire body enclosed except the head. The temperature, as a rule, rose rapidly, reaching 40 C. (104 F.) within one and one-half hours. During this time the axillary temperature was noted by means of a recording thermometer and the oral temperature was taken at fifteen minute intervals. When the patient was removed to his bed, the oral temperature and the pulse were taken at one-half hour intervals during the treatment, and then hourly until normal.

When the desired degree of temperature was reached, the patient was removed to his bed, wrapped in warm blankets and encased in a bag made of rubber sheeting. During this procedure, the temperature usually fell from 0.3 to 0.5 degree C., but this was quickly recovered. The patient maintained his fever for a period of from six to seven hours by this means and was then removed from the blankets and given a warm alcohol rub. Hyperpyrexia was considered to begin when a temperature of 39 C. was reached. Warm lemonade containing 0.6 per cent sodium chloride and sugar to taste was administered throughout the treatment, the patient receiving 3 or 4 liters.

Blanket Method.[15]—During the past two months we have devised a simple method of inducing hyperpyrexia by wrapping the patient carefully in blankets and rubber sheeting. Oral temperatures of from 40 C. (104 F.) to 41 C (105.8 F.) could be produced and maintained for six hours by this means. This was accomplished in each of the seventy-five instances in which it was attempted. The accompanying chart illustrates the changes in oral temperature, pulse rate and respi-

8. Kolmer, J. A., and Rule, Anna M.: Hot Baths in Experimental Primary Syphilis of Rabbits and in Trypanosomiasis in Rats, Arch. Dermat. & Syph. **27**: 660 (April) 1933.

9. Schamberg J. F., and Tseng, Hsien-Wu: Experiments on the Therapeutic Value of Hot Baths, wtih Special Reference to the Treatment of Syphilis and Some Physiological Observations, Am. J. Syph. **11**: 337 (July) 1927.

10. Kerl, W.: Malaria Behandlung der Frühlues, Arch. f. Dermat. u. Syph. **157**: 294, 1929.

11. Kemp, J. E., and Stokes, J. H.: Fever Induced by Bacterial Proteins in the Treatment of Syphilis, J. A. M. A. **92**: 1737 (May 25) 1929.

12. Neymann, C. A., and Osborne, S. L.: The Physiology of Electropyrexia, Am. J. Syph. & Neurol. **18**: 28 (Jan.) 1934.

13. Bessemans, A., and Thiry, U.: New Experiences with the Application of Local Heat and Diathermy by Long Waves (Slightly Damped) in the Treatment of Primary and Secondary Syphilis in Man, Urol. & Cutan. Rev. **37**: 377 (June) 1933.

14. Through the courtesy of the Electrical Research Corporation, we were permitted to use this apparatus, known as the Hyperpyrexator.

15. Technical aid in developing the blanket method of producing artificial fever was rendered by Miss Sarah Nieder.

rations that occur during the average treatment in which the blanket method is used. After the patient is wrapped in the blankets and rubber sheeting there is an even and gradual rise in the oral temperature, usually 0.2 degree C. in fifteen minutes or 0.8 to 1 degree C. per hour; 39 C. (102.2 F.) is reached in from three to four hours and 40 C. (104 F.) in from four to five hours. The oral temperature is maintained between 40 C. (104 F.) and 40.5 C. (104.9 F.) or higher for the period desired. The pulse rarely exceeds 140 per minute and the respiration rate 28 per minute at any time during the treatment. The rate of rise of temperature can be greatly increased by placing a common electric bake over the bed for one to two hours before the heavy woolen blankets, canvas and rubber sheeting are wrapped around the patient. This method employs the principle of preventing radiation of heat from the body surface, which is also an integral part of the technic described by Neymann and Osborne in their diathermy method. These authors [12] also attempted to use blankets alone but were unsuccessful in obtaining temperatures of therapeutic height. They state that they observed a rise of temperature up to 102.2 F. in eight hours by this means.

Haddon and Wilson [16] state that they were able to induce hyperpyrexia by means of blankets and hot water bottles, but they do not describe the method or the degree of fever they obtained.

Technic: The patient requires no preparation and may have his breakfast. Long woolen socks are placed

TABLE 1.—*Clinical Material*

Case	Sex	Age	Date of Entry	Stage of Syphilis	Duration of Infection	Location of Lesions	Type of Lesion	Previous Treatment	Period of Observation	Number of Treatments
1	♀	21	9/ 6/33	Secondary	Lesions present 2 weeks	Face, chest, arms and tongue	Mucous patch under tongue; papules on body	None	5 wks.	2
2	♀	20	11/25/33	Secondary	Eruption present 1 month	Face, trunk, limbs, labia and about anus	Maculopapular eruption; condylomas about anus	None	7 wks.	7
3	♂	46	12/23/33	Secondary	1 month	Penis, general maculopapular eruption	Primary on prepuce; maculopapular eruption	None	15 wks.	16
4	♀	23	6/ 7/33	Primary	2 weeks	Labia minora	Single superficial ulcer	None	9 wks.	8
5	♀	23	6/15/33	Secondary	Sore throat 2 weeks	Generalized papular eruption; mucous patch on tonsil	Papular eruption	.....	10 wks.	8
6	♀	29	6/20/33	Secondary	6 weeks	Generalized maculopapular eruption	Labial ulcer	None	6 wks.	8
7	♀	29	7/23/33	Primary	Lesion noted 4 days	Tongue	Superficial ulcer	None	9½ wks.	8
8	♀	24	2/ 2/34	Secondary	Eruption 3 weeks	Generalized eruption, papules on vulva	Large, infiltrated, papular; mucous patches on vulva	None	9 wks.	8
9	♂	24	6/ 7/33	Late secondary; condylomata lata	4 years recurrent	About anus	Large, moist condyloma	None	7 wks.	8
10	♂	23	10/26/33	Late secondary	3 months	Anus	Condylomata lata	None	26 wks.	16
11	♂	23	10/27/33	Primary	3 weeks	Penis	Chancre	None	2 wks.	4
12	♀	28	1/ 5/34	Secondary	2 weeks	Generalized eruption, vulva	Mucous patches	None	15 wks.	12
13	♂	25	1/28/34	Primary	3 weeks	Penis	Chancre	None	4 wks.	5
14	♀	29	5/24/33	Recurrent, secondary	10 years	Tongue and vulva	Mucous patch	None for 2 years	2 wks.	2
15	♂	40	6/ 8/33	Secondary	Eruption 3 weeks	Generalized eruption; mucous patch lips and penis	Mucous patch	None	9 wks.	7
16	♂	40	7/ 1/33	Secondary	Eruption 5 weeks	Generalized eruption; fissures at angles of mouth	Mucous patch	None	5 wks.	6
17	♀	16	10/25/33	Primary	2 weeks	Vulva	Sore on vulva	None	3 wks.	7
18	♂	20	12/23/33	Primary	7 days	Penis	Chancre	None	6 wks.	7
19	♂	34	.....	Secondary	1 month	Generalized eruption penis	Maculopapular eruption	None	5 days	1
20	♂	17	.....	Secondary	3 months	Penis	Superficial sore	None	5 days	1
21	♀	29	.....	Secondary	1 month	Generalized eruption mouth	Papular eruption; mucous patches	None	5 days	2
22	♂	28	.....	Secondary	2 months	Anus	Condylomas	None	5 days	2
23	♂	41	.....	Secondary	2 weeks	Generalized eruption genitals	Papule on skin	None	5 days	2
24	♂	38	.....	Secondary	4 days	Generalized maculopapular eruption; induration on penis	Induration on penis	None	5 days	2
25	♂	20	.....	Secondary	1 month	Face, penis, scrotum	Papules	None	5 days	1
26	♂	31	.....	Primary	3 weeks	Penis	Chancre	None	5 days	1
27	♂	44	.....	Secondary	1 month	Generalized maculopapular eruption; sore on penis	Maculopapular eruption	None	5 days	2
28	♂	31	.....	Primary	6 days	Penis	Chancre	None	5 days	1
29	♂	18	.....	Secondary	Generalized eruption 2 months	.....	Papule	None	5 days	2
30	♂	24	.....	Primary	.....	Penis	Chancre	None	5 days	2
31	♂	40	.....	Primary	5 days	Penis	Chancre	None	5 days	2
32	♂	28	.....	Primary	.....	Penis	Chancre	None	5 days	1
33	♀	14	.....	Primary	1 month	Labia	Chancre	None	5 days	2

16. Haddon, S. B., and Wilson, George: Thermic Treatment of Neurosyphilis, Pennsylvania M. J. **36**: 829 (Aug.) 1933.

on the feet and legs. A heavy woolen blanket, a large canvas sheet and a rubber sheet large enough to cover the entire patient are placed on the bed. Each limb, the trunk and the shoulders are wrapped individually with warm, thin bath blankets. Then the entire body is wrapped in a bath blanket no part of the patient being left uncovered except the face. Seven bath blankets are used.

The heavy woolen blanket, the canvas sheet and the rubber sheeting are then successively brought over the patient. Two more heavy woolen blankets are used: one covers the lower half of the body, including the feet; the other is wrapped around the entire patient. One hundred and sixty cubic centimeters of hot (100 F.) lemonade containing 0.6 per cent of sodium chloride and sugar to taste is given orally at one-half hour intervals, the patient receiving from 3 to 4 liters of the fluid. The oral temperature and the pulse at the temple are taken at one-half hour intervals during the treatment and then hourly until normal.

General Care of Patient During Hyperpyrexia.—The care of the patient during the treatment is the same whether the blanket method or the heat cabinet is used. A hypodermic injection of morphine sulphate one-fourth grain (0.016 Gm.) and atropine sulphate 1/150 grain (0.0004 Gm.) is given for restlessness, usually when the temperature reaches 39 C. (102.2 F.), following which the patient may sleep through the treatment. Morphine sulphate one-sixth grain (0.01 Gm.) may be given later if necessary. The patient is carefully observed throughout the period of hyperpyrexia for any unusual reactions. A rapid rise of temperature above 40.5 C. (104.9 F.) should be controlled by loosening the blankets, fanning the body, administering cool drinks or, if the condition is alarming, by a cool colonic flush. A rapid rise of the pulse rate above 150, a

TABLE 2.—*Dark Field Examinations for Spirochaeta Pallida*

Case	Location of Lesion Examined	Before Treatment	After First Treatment			Subsequent
			Immediately	12 Hours	24 Hours	
1	Under tongue	Positive	None seen	No serum obtainable	Lesion not visible	
2	About anus	20-25 per field	5-6 per field with loss of motility	6-7 per field, nonmotile	49 hours; 15-20 per field; majority nonmotile with occasional actively motile	After 2d treatment, 1-2 motile; after 3d treatment, 1 in 2 fields; after 4th became negative and remained negative; biopsy of condylomas after 6th treatment negative
3	Penis	Negative (6 exams.) 4-5 on recurrent lesion	1 spirochete in 3-4 fields	2 spirochetes in entire preparation	.....	Spirochetes were not found after the 4th day after treating the recurrence
4	Labia minora	Numerous	8 hrs., numerous, nonmotile	.....	Negative	Remained negative
5	Papule on back	Positive	Negative	.....	.....	2 days later, positive; 5 days later, 2 treatments, positive; 7 days later, 2 treatments, became negative; inguinal gland negative for spirochetes
6	Labial ulcer	2 per field	Nonmotile spirochetes	2 slightly motile	Negative	3 days after 1st treatment, 2 spirochetes; negative and remained negative after 2d treatment
7	Tongue	Positive	Negative	Negative	Negative	
8	Skin papule	1 in 5-6 fields	Negative	Negative	Negative	Inguinal lymph gland removed 2/3/34, negative
9	Condyloma	Positive	1 active; numerous nonmotile	21 hours: negative	26 hours: 1 after 1st treatment	3 days after 1st treatment, negative
10	Anus	Positive	Negative	Negative	Negative	Negative; left inguinal gland removed 11/14/33, negative
11	Penis	10/27/33 positive	Negative			
12	Vulva	4-6 per field	8-10 motile	.....	.....	3 days after 1st treatment, 2-3 per field; 9 days after, 1 in 2 fields; 12 days later, no serum; inguinal gland removed 1/6/34, negative
13	Penis	Positive	2 per field	.....	Negative	
14	Tongue and vulva	Positive	Positive	Positive	Positive	3d day, negative
15	Penis	Positive	Positive	Negative	Negative	Negative
16	Mouth, penis	Lip positive Penis positive	Positive Positive	Positive Positive	Positive Positive	Negative on 5th day Remained positive throughout observation
17	Vulva	Positive	3 sluggishly motile spirochetes per field	Negative	Negative	
18	Penis	Positive	.....	2 spirochetes	.....	2 days after treatment, negative; remained negative
19	Penis	Positive	3 spirochetes per field	Negative	Negative	Negative
20	Penis	Positive	.....	1 motile	.....	Negative 3 days later
21	Labia	3 motile spirochetes	.....	36 hours: negative	.....	Negative
22	Condyloma	Positive	8-10 motile spirochetes per field	.....	.....	Negative after 2d treatment
23	.....	Positive	Positive	.....	.....	2 days after treatment, 1 to 4-5 fields; after 2d treatment, negative
24	Penis	Positive	.....	1-2 spirochetes per field	.....	2 days after treatment, 15 per field; after 2d, negative on 3d examination
25	Penis	Positive	Negative	Negative	Negative	
26	Penis	Positive	Negative	Negative	Negative	
27	Penis	Positive	1-2 spirochetes per field	Negative	Negative	
28	Penis	Positive	Negative	Negative	Negative	
29	Penis	Positive	1 spirochete	Negative	Negative	
30	Penis	Positive	3 nonmotile spirochetes	Negative	Negative	
31	Penis	Positive	3 per field active	.....	.....	Negative after 2d treatment
32	Penis	Positive	Negative	Negative	Negative	
33	Labia	Positive	Positive	Positive	Positive	

tendency to collapse, or the onset of tetany are indications for reducing the temperature or discontinuing the treatment. The blood pressure should be taken before the treatment is started and, in the event of an unusual reaction during the treatment, should be retaken. There is a tendency for the systolic blood pressure to fall from 20 to 30 mm. of mercury. A decline of the systolic blood pressure below 80 mm. of mercury should be considered sufficient to discontinue the treatment. The blood pressure is an excellent indicator of the patient's condition. The necessity of careful nursing attention during the treatment cannot be overemphasized.

The hyperpyrexia is usually well tolerated, and we encountered no serious untoward reactions in this series. As a rule, the patient recovers from his treatment quickly and is able to return to his work within twenty-four hours. The procedure requires twenty-four hours of hospitalization. Herpes simplex occurred in practically every patient after the first or second treatment but did not recur during the rest of the series. No burns were encountered. In no instance was it necessary to discontinue the treatment because of untoward reactions.

Patients of advanced age, those with serious cardiac or pulmonary disease, or those with a severe degree of arteriosclerosis were not accepted for the treatment. It may be stated that a patient who is not a good physical risk for a major abdominal operation would be a poor risk for hyperpyrexia as well. The development of an infection of the upper respiratory tract during the course of treatments was considered sufficient cause to discontinue them until the patient had recovered. The patient is subjected to a physical examination before each treatment.

TABLE 3.—*Serologic Changes and Clinical Course of Lesions*

	Before Treatment			After Treatment			
Case	Blood Wassermann	Kahn	Spinal Fluid	Blood Wassermann	Kahn	Spinal Fluid	Clinical Course of Lesions
1	++++	++++	.....	10/6/33 ++++	++++	.....	Eruption faded promptly; mucous patches cleared in 5 days
2	++++	++++	.....	1/17/34 ++++ 2/ 7/34 + 2/21/34 ++++	++++ ++ ++++	.....	General eruption cleared in 1 week; condylomas became drier within 1 week and cleared in 3-4 weeks
3	++++	++++	.....	2/ 7/34 Neg. 2/21/34 Neg. 4/11/34 ++++	+ ++ +++	.....	Generalized eruption faded in 1 week; large penile sore cleared in 1 week, 11 days after 8th treatment mucous patches appeared on ventral surface of penis which cleared within 1 week after resuming hyperpyrexia treatments; lesion began to clear within 24 hours; no recurrence developed within 7 weeks of further observation
4	++++	++++	6/23/33 Neg.	6/28/33 ++++ 7/14/33 ++++	++++ ++++	.....	In spite of negative dark field, lesions healed slowly in three weeks; lesion was frequently abraded for dark field examination
5	++++	++++	6/21/33 Neg.	6/28/33 ++++ 7/14/33 ++++	++++ ++++	.....	Papules on covered parts of body healed in 2-3 weeks; papules on forehead persisted and increased in number; fever which patient had before treatment subsided after 1st treatment; sore throat cleared 7 days after 1st treatment
6	++++	++++	6/28/33 Neg.	9/ 9/33 ++++ 7/13/33 ++++	++++ ++++	After 7th treatment neg.	Primary cleared in 1 week; eruption faded rapidly
7	++++	++++	.....	8/27/33 ++++	++++	After 2d treatment, 7/26/33, neg.	Lesion cleared 3-4 days
8	++++	++++	Wass. neg.; Kahn neg.; globulin normal; colloidal gold 3321000000	2/15/34 ++++ 2/28/34 ++++	++ ++++	3/19/34, Wass. neg.; Kahn neg.; globulin normal; colloidal gold 0000000000	Lesions cleared rapidly, leaving deep pigmentation; symptomatically improved immediately; mucous patches developed on lower lip 10 days after 8th treatment
9	++++	++++	Negative	6/17/33 ++++ 6/24/33 +++ 6/30/33 ++++ 7/ 9/33 +	++++ ++ +++ ++++	.....	Condylomas became drier and smaller promptly; completely healed in 3 weeks
10	++++	++++	Negative	12/20/33 + 1/10/34 +++ 3/21/34 ++++	..... +++ ++	3/28/34 neg.	Lesions cleared promptly
11	Negative	Negative	.....	.....	.....	.....	Lesions healed promptly within 1 week
12	++++	++++	.....	1/31/34 ++++ 2/ 7/34 ++++ 2/14/34 ++++ 2/21/34 ++++	++++ ++++ ++++ ++++	3/1/34 neg.	Lesions healed in 12 days; 20 days after 8th treatment, mucous patch appeared on vulva
13	++++	++++	.....	10/24/33 ++++	++++	.....	Lesion healed in about 10 days
14	++++	++++	.....	.....	.....	.....	Lesion healed within 5 days after treatment
15	++++	+++	Negative	6/14/33 ++++ 6/21/33 ++++ 6/30/33 ++++ 7/17/33 ++++ 8/17/33 ++++	++++ ++++ +++ ++++ ++++	6/23/33 neg.	Eruption cleared rapidly; mucous patches cleared within 5 days
16	++++	++++	.....	7/13/33 ++++	++++	7/26/33 neg.	All lesions except fissures at corners of mouth healed promptly
17	Neg.	.....	.....	10/30/33 Neg. 11/15/33 Neg.	+ Neg.	.....	Lesions healed in 5 days
18	Neg.	.....	.....	1/11/34 Neg.	Neg.	.....	Chancre cleared slowly

ADVANTAGES OBTAINED FROM USE OF THE BLANKET METHOD

The blanket method, as described, has been used in a sufficient number of cases to indicate that hyperpyrexia may be regularly induced by this means. It has the following advantages:

First, the necessity of expensive electrical equipment is eliminated.

Second, there is no danger of electrical burns.

Third, in our experience it is less exhausting to the patient than diathermy or the heat cabinet. The rise in temperature is gradual and there is little disturbance of the pulse and respiratory rates.

Fourth, through these advantages it increases the availability of artificial fever therapy.

CLINICAL STUDIES

Plan of Clinical Investigation.—As our purpose in this problem was to study the effects of hyperpyrexia on the lesions of early syphilis, only patients in the primary and secondary stages of the disease were accepted. All these patients presented lesions in which Spirochaeta pallida was demonstrated by dark field examination. Only one patient had received any antisyphilitic chemotherapy, and she had late secondary manifestations from which numerous spirochetes were demonstrated.

There were thirty-three patients in this series (table 1), twelve being females and twenty-one males. The ages varied from 14 to 46, the majority falling between 20 and 30 years. Twelve were in the primary stage and twenty-one presented various lesions of secondary syphilis.

The cases may be divided into two groups: those that were under our complete control for a period varying from two weeks to six months, and those we were permitted to study for five days only before administration of arsphenamine. There were fifteen patients in the latter group and eighteen in the former. With the five-day cases, observations were made on the dark field examinations only, while in the others the course of the clinical lesions and the serologic changes, in addition, were studied. All patients were hospitalized during their period of contagiousness.

Following admission to the hospital, the patient was carefully examined as to his physical fitness for pyretotherapy, and the dark field examinations were recorded. Dark field examinations were done immediately after the period of hyperpyrexia, twelve hours later, and at twenty-four hour intervals until the experiment was concluded. The blood Wassermann and Kahn tests were done frequently, and the effect on the clinical course of the lesions was noted. Several spinal fluid examinations were done. Treatments were given at intervals of from three to four days.

DARK FIELD EXAMINATIONS

Of the thirty-three patients studied, dark field examination immediately after the first treatment failed to show the presence of Spirochaeta pallida in ten cases. Dark field examinations were considered negative only when a fifteen minute search failed to reveal Spirochaeta pallida. In nine cases the dark field was positive immediately after the first treatment but became negative before the second treatment was given. In several instances a distinct change in the motility of the organisms was noted immediately after treatment. A complete loss of motility in some, or the occurrence of sluggish and occasionally convulsive movements in others, was observed. It is interesting to note that Bessemans and Thiry [13] reported similar observations in their work on the local heating of syphilitic lesions. These changes are evidence of injury to Spirochaeta pallida, as shown by investigators [17] using chemical spirocheticides.

Summarizing the results by dark field examination, twenty-two of the cases, or 66⅔ per cent, became negative after the first hyperpyrexia treatment; seven, or 21.2 per cent, became negative after the second; one, or 3 per cent, became negative after the third treatment, and one case, or 3 per cent, after the fourth treatment. In one patient, a five-day case, the dark field remained positive after two treatments, and in a second patient, except for a fissured papule at each commissure of the mouth, all lesions, including a generalized maculopapular eruption, moist papules over the genitalia, and mucous patches in the mouth, cleared and became negative for Spirochaeta pallida after two treatments. The fissures at each corner of the mouth persisted and were still positive for Spirochaeta pallida by dark field examination after six treatments, at which time the observation period was concluded.

Table 2 shows the results of the dark field examinations.

CLINICAL COURSE OF LESIONS

In general, it may be stated that the clinical course of the lesions paralleled the dark field examinations. When the spirochetes disappeared, healing took place promptly. The response of the lesions, as well as the dark field examination, was dependent on the character of the treatment given and the location and type of lesion present. When the patient received six or seven hours of a temperature over 40 C. (104 F.) the result was prompt, with disappearance of Spirochaeta pallida from the lesions and rapid healing. When the hyperpyrexia was not so satisfactory and the temperature remained for the most part between 39 C. and 40 C., the response was not as satisfactory.

The type of lesions also affected the clinical course, as mucous patches and superficial moist papules healed rapidly after treatment, that is, within from five to seven days, while deeply infiltrated papules and large condylomas involuted more slowly, requiring from two to three weeks. We found that the lesions on the face—that is, the exposed surface of the body—during the treatment involuted more slowly than those on the covered parts of the body. This is illustrated by case 5, in which there was a generalized maculopapular eruption with moist papules over the vulva, mucous patches in the mouth and infiltrated papules over the forehead. All the lesions cleared rapidly except those on the face, where they even increased in size. In case 16 we were unable to cause the fissured papules at each corner of the mouth to heal or become negative for Spirochaeta pallida by dark field examination after six treatments, while the rest of the lesions cleared promptly with two treatments.

In three cases of secondary syphilis, clinical recurrences were observed. In one, a mucous patch developed on the glans penis eleven days after the eighth treatment. This lesion was positive for Spirochaeta pallida but cleared promptly within three days when pyretotherapy was resumed, also becoming negative for Spirochaeta pallida. In the second of these cases a mucous patch appeared on the vulva twenty days after the eighth hyperpyrexia treatment. This was positive for Spirochaeta pallida and cleared within twelve days after pyretotherapy was resumed. In the third patient a mucous patch developed, positive by dark field for Spirochaeta pallida, on the lower lip ten days after the eighth hyperpyrexia treatment. In none of the patients with primary syphilis were recurrences observed.

SEROLOGIC CHANGES

Of the eighteen cases under observation a sufficient length of time for serologic changes to be noted, fifteen

17. Wilkes-Weiss, Dorothy, and Weiss, Charles: Experiments on the Purification of Cultures of Spirocheta Pallida by Chemical Methods, J. Infect. Dis. **38**: 289 (April) 1926.

presented strongly positive blood Wassermann and Kahn reactions, and three were negative before treatment. The latter remained negative during their periods of observation; that is, two, three and six weeks, respectively. In those with strongly positive serologic reactions, there were some temporary fluctuations, but all showed strongly positive blood Wassermann and Kahn reactions at the conclusion of their hyperpyrexia treatments.

Spinal fluid examinations were done in seven patients before treatment; in four of these the spinal fluid was reexamined after treatment. In three cases the spinal fluid was examined only after treatment had been given. A total of fourteen spinal fluid examinations was done, but none showed definitely abnormal changes.

Table 3 presents the serologic changes.

EFFECT ON THE PATIENTS

Among those patients with secondary syphilis, all experienced symptomatic relief. Patient 5 was of interest, as at the time of entry she had a fever as high as 38.5 C (101.3 F.) for several days. Immediately following the first treatment her temperature became normal and remained so.

COMMENT

From the observations reported here concerning the effects of hyperpyrexia on the lesions and clinical course of early syphilis, it is evident that artificially produced fevers of from 39 C. (102.2 F.) to 40.5 C. (104.9 F.) and maintained for a period of six or seven hours do not sterilize the human body of Spirochaeta pallida. This is shown by the three clinical recurrences that developed after the hyperpyrexia treatments had been discontinued. The fact that the patients who had strongly positive blood Wassermann and Kahn tests on entry showed no permanent change after hyperpyrexia would indicate that the infection had not been greatly affected.

Experimental workers have shown that Spirochaeta pallida will die at 40 C. (104 F.) in two hours in vitro, and also in human tissues, and in shorter periods of time at higher temperatures. In the hyperpyrexia treatments as given in this work, the optimum temperature of 40 C. (104 F.) is not obtained in all the tissues of the body. The temperature of the skin of the uncovered portion of the body, that is, the face, is lower than that of the covered parts of the body at the height of the treatment, and probably never exceeds 39 C. (102.2 F.). It is of interest that lesions which were on the face of patients regressed much more slowly than those on the covered parts of the body. According to the work of our colleague Dr. John J. Sampson, there is a wide variation in the temperature attained by the skin, the subcutaneous tissue, the muscles and the venous blood as measured by means of a needle thermocouple. He found that the temperature of the venous blood in the median basilic vein rose more slowly than the other tissues and did not exceed 39.4 C. (102.9 F.), even when the oral temperature was 40.7 C. (105.3 F.). In general, the venous blood remained from 1 to 3 degrees C. below the oral temperature. The temperature of the subcutaneous tissue also remained considerably below the oral temperature. The temperature of the intramuscular tissue exceeded the oral temperature by from 0.8 to 1.4 degrees C., and the rectal temperature tended to approach these ranges.

Neymann and Osborne [12] also noted that the temperature of the subcutaneous tissue rose more slowly than the other tissues of the body. As they state, it is probably because of the inability to raise the temperature of the entire body to a sufficient height that accounts for the unsatisfactory results obtained by others and ourselves in the treatment of early syphilis by means of artificial fever.

The prompt disappearance of Spirochaeta pallida from lesions exposed to a high temperature substantiates the view that this organism can be destroyed by temperatures between 40 C. (104 F.) and 41 C. (105.9 F.). If a method could be devised that would raise the temperature of all the tissues of the body to a proper height, the eradication of early syphilis by this means might be accomplished.

A description of a method of inducing hyperpyrexia by the use of blankets alone is included in this report. Its simplicity and the fact that expensive equipment is not needed should increase the availability of this mode of therapy. The treatment given in this way has been less exhausting to the patient than other methods that we have used.

SUMMARY AND CONCLUSIONS

1. In thirty-one of thirty-three cases of early syphilis, or 94 per cent, the dark field examination was rendered negative for Spirochaeta pallida by means of hyperpyrexia alone.
2. The clinical lesions of early syphilis healed promptly in all cases in which the dark field examination became negative.
3. Three clinical recurrences were observed after cessation of the treatment.
4. The serologic reactions were not reversed from positive to negative in any case.
5. Inability to elevate the temperature of all the tissues of the body to the thermal death point of Spirochaeta pallida probably accounts for the failure to sterilize the body of these organisms.
6. Hyperpyrexia alone is not a satisfactory method of treatment of early syphilis.

450 Sutter Street.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. CHARGIN, LEIFER AND HYMAN AND DRS. EPSTEIN AND COHEN

DR. HOWARD J. PARKHURST, Toledo, Ohio: Drs. Epstein and Cohen have produced therapeutic fever in a series of cases by a method that is interesting because of its simplicity, availability and cheapness. I refer to the blanket method, which may be carried on very well in the home, the only requirement being the constant supervision of a thoroughly experienced nurse. Like all other methods in use, it has shortcomings. It is unfortunate that the temperature of all parts of the human body cannot be raised uniformly to the thermal death point of the spirochete. Perhaps in the future this may be accomplished by some combination of radiant and penetrating heat, or otherwise. Much more work is required. An important point that was not brought up in this paper is the possible value of fever therapy not used alone but as a supplement to the usual chemotherapy in the treatment of early syphilis. Richet and his co-workers in France and Tenney in New York have published favorable reports, and further investigations should be made.

DR. CLYDE L. CUMMER, Cleveland: If found free from untoward results and undue complications, the method proposed by Dr. Chargin and his co-workers would present great advantages. However, the number of cases is insufficient for final conclusions as to the clinical and serologic results or the frequency and seriousness of the complications, and the time period

covered by the observations is not long enough to judge of the efficiency of cure as compared with the generally accepted methods, which have been so carefully studied by many workers since Ehrlich's discovery. Certain questions arise: First, what will be the effect of condensing treatment on the development of natural resistance, and, when the rest periods come, what about the incidence of neurorecidives? What about the later effects on liver, skin and cardiovascular system and the nervous system? The well recognized tendency of arsenic to accumulate and the occurrence of remote effects sometimes after the lapse of years makes one wonder what one could expect with this method of massive treatment. The percentage of neuritic symptoms was high. While they cleared up in some cases after the lapse of some time, will there be permanent damage? The number of complications impressed me as being rather high, compared with the figures of the combined research of Cole, Moore, Weil, Stokes and O'Leary, in which the total reactions range between 1920 to 1931 in some 163,000 injections as about fifteen in a thousand, or 1.5 per cent. The figures of Drs. Chargin, Leifer and Hyman showed that the skin reactions were present in 33 per cent of cases, polyneuritis in 32 per cent, and fever in 80 per cent or more. Doubtless some patients showed more than one of these sequelae. The basis of comparison is not fair, because these figures are based on patients and these group studies were based on the number of injections. The chief drawbacks to the method are the effects on the veins, the possibility of later systemic effects, the high incidence of immediate skin and nerve complications, and the uncertainty of permanently curative results as compared with the well established routine, and the requirement of hospitalization, which prohibits general employment in large clinics and in many private patients.

DR. WALTER M. SIMPSON, Dayton, Ohio: I will restrict my discussion to the paper by Drs. Epstein and Cohen. It is now apparent that simple fever production is the common denominator of all the methods that have been employed for the fever therapy of syphilis, whether malaria, relapsing fever, rat-bite fever, foreign protein substances, hot baths, electric blankets, diathermy, radiothermy or the newer radiant heat methods. There is no evidence that the malarial plasmodium possesses intrinsic merits. I have completed the treatment of some fifty cases of neurosyphilis, and the results obtained with a variety of physical modalities, including diathermy, radiotherapy and radiant heat methods, indicate that they are at least comparable to those obtained with malaria. In all these cases I have combined antisyphilitic chemotherapy with artificial fever. Many reports in the literature indicate that the combination of fever therapy and chemotherapy gives the most prompt and lasting results. The application of fever therapy to early syphilis is still strictly experimental. In forty-six patients with fresh syphilis in whom positive dark fields were obtained and in whom the fever was rapidly elevated to 106 F. and maintained there for five hours, I have never succeeded in finding spirochetes in the primary lesion after the first treatment with fever. I have made thermometric gradient studies which indicate that there is no essential difference in the deep temperature levels produced by either radiant heat or high frequency methods. The two are equally effective. One important drawback to some of the physical methods is the slow induction of fever. Any method that prolongs for from two to four hours the elevation of temperature to 106 F. provides an exhausting experience for the patient. This is readily overcome by utilizing one of the methods available for the rapid induction of fever, which can then be controlled readily for maintenance at the desired temperature level. All my patients are now being treated as ambulatory patients. I have finished the treatment of some 325 patients without accident. No patient has been injured by the treatment, and a minimum course of fever therapy for syphilitic patients has been fifty hours of sustained fever, usually given in ten weekly treatments of five hours each, with the fever sustained between 105 and 106 F. In the present state of knowledge it is hazardous to carry out this treatment in any place but an institution, under the careful and constant supervision by a physician who has made himself thoroughly aware of all the medical and physical principles involved, utilizing trained nurse-technicians.

DR. HAROLD N. COLE, Cleveland: It may be that it would be better to have a method that will bring the temperature up to 106 rapidly and hold it at a level and then drop it, but it will not be possible for different institutions to have expensive machines such as Dr. Simpson has or the one that has been installed over at the City Hospital. But I think this should be followed out, and it may work very well along with the other methods in the treatment of syphilis. I am interested in the drip method that Dr. Chargin and his co-workers have suggested. It is true that there seemed to be quite an increase in the amount of toxic symptoms from this method and that it will have to be toned down, but the idea that these authors have started on is very good. If it should be possible to use somewhat smaller doses and immediately follow them up with bismuth therapy, not giving a lapse of treatment, this might be a valuable addition to the treatment of syphilis.

DR. HARRY M. ROBINSON, Baltimore: In discussing the paper by Drs. Chargin, Leifer and Hyman, I apologize for attempting to talk on a technic with which I am not familiar. There is some gap between animals and human beings that it has never been possible to fathom. One can accomplish in animals easily what one apparently can never accomplish in human beings. The danger of mass therapy always brings forth to me the danger of abortive therapy. Some patients will become negative serologically with one or two injections of arsphenamine of moderate dosage, 0.3 Gm. for a female, 0.4 Gm. for a male, and a comparable dose of neoarsphenamine. Other patients, as Dr. Chargin and his co-workers have shown, will not become seronegative under two courses of arsphenamine interspersed with bismuth compounds. Certainly the future danger of neurorecurrences or cardiovascular disease is very great, and one must tread this matter of therapy gingerly. In the University Hospital clinic of which I have charge, treatment for two Negro patients of 0.45 Gm. each had been ordered. I advised that my associate use a 0.9 Gm. ampule, dividing it, giving half to one patient and half to the other. When we went to look for the 0.9 Gm. ampule it was nowhere to be seen. Instead, there were two 4.5 Gm. ampules laying on the table, and each of these Negro patients had received at one injection 4.5 Gm. Strange to relate, one patient developed no untoward reactions, and the other no more than moderate nausea and vomiting. It is also strange, in view of the experience of Dr. Chargin and his co-workers, that the Wassermann reaction did not become more rapidly negative, and in one patient we had to continue the treatment as any other patient received it. The other patient failed to return and we could never locate him.

DR. NORMAN N. EPSTEIN, San Francisco: There are three points I want to emphasize. First, although radiant heat is a simple method of producing hyperpyrexia, this procedure should be done with extreme care. As Dr. Simpson has stated, it requires a trained nurse in constant attendance and physicians experienced in fever therapy. Second, several patients can be treated simultaneously. One nurse can take care of four or five patients if placed conveniently close to one another. The temperature can be raised rapidly by radiant heat, combining the blanket method with a simple electric baker over the bed for one or two hours. Third, the patient is ambulatory and remains in the hospital for only twenty-four hours for a single treatment. In this way fever therapy can be made a part of routine antisyphilitic therapy without interfering with the economic status of the patient. Any patient with central nervous system syphilis who fails to react satisfactorily to a reasonable amount of chemotherapy should be given fever therapy as well.

DR. LOUIS CHARGIN, New York: I realize that our experience with this method of therapy has been too limited to warrant its recommendation as a routine method. Our experience, however, does demonstrate that it merits further trial, particularly in the treatment of early syphilis. Such a trial should, however, be given under fully controlled conditions, which include proper choice of material, hospitalization of the patients, accuracy in technic and careful observation during and after treatment. I should like to repeat that this method of therapy is an approach to Ehrlich's therapia sterilisans magna. From knowledge gained in experimental animal syphilis and experience in human syphilis, it is fair to assume that, if a scheme can be devised that will permit of the massing of the organic

arsenicals in sufficient quantity with safety, such a method will offer the best outlook for a cure of syphilis in the greatest percentage of cases. The intravenous drip method is an effort in this direction. In administering such large amounts of the arsphenamines in so short a space of time, we naturally feared the toxic effects of the arsenic, but we are glad to be able to state that these have been comparatively mild in character. Our greatest difficulty has been with polyneuritis. The percentage of cases observed has been higher than is usual with the other intensive method of therapy, but all the cases have cleared up in a comparatively short time. We hope to continue this work but expect to use arsphenamine instead of neoarsphenamine, since the former is more stable. Perhaps we shall thus avoid the high percentage of polyneuritis. Dr. Cummer has brought up the question of natural resistance. It seems that the majority of opinion is not in favor of waiting for immunity to develop. The tendency seems to be rather to treat intensively as soon as the diagnosis has been established. Dr. Cole's suggestions are well taken. In the next series of cases we hope to make use of both bismuth compounds and arsphenamine and can perhaps show even better results than in this series of cases. The experience of Dr. Robinson is by no means unique, since there are already reported in literature several such instances, in none of which there seems to have been serious damages as a result of these enormous doses of arsenic.

PULMONARY MANIFESTATIONS IN HUMAN TULAREMIA

A CLINICAL STUDY BASED ON THIRTY-FIVE UNSELECTED CASES

STAIGE D. BLACKFORD, M.D.
UNIVERSITY, VA.

The pleuropulmonary manifestations of tularemia have never been the subject of a detailed clinical report, although they are now regarded as a part of the disease.[1] This report is based on an analysis of the clinical evidence of pleuropulmonary involvement discovered in thirty-five cases in which the diagnosis of tularemia was made either by an agglutination test or by the recovery of the organism.

Data relative to the individual tularemic infections are listed in table 1. The respiratory symptoms, physical signs and roentgenologic diagnoses of the thirty-five cases are presented in table 2. Both clinical and roentgenologic evidences of intrathoracic disease were found in seventeen patients and roentgenologic evidence alone was present in fifteen. Chest films in thirty-two of thirty-four patients were abnormal and roentgenologic changes in these films are the subject of a separate report.[2] This presentation deals primarily with the seventeen patients in whom clinical indications of pleuropulmonary involvement were found. These cases will be grouped for discussion under three headings:

1. Tularemic pneumonia, seven cases.
2. Tularemic bronchitis, seven cases.
3. Tularemic pleural effusion, three cases.

From the Department of Internal Medicine, University of Virginia Hospital.

1. (*a*) Massee, J. C.: Tularemia in Georgia: Report of a Fatal Case, J. M. A. Georgia **20**: 66 (Feb.) 1931. (*b*) Permar, H. H., and Maclachlan, W. W. G.: Tularemic Pneumonia, Ann. Int. Med. **5**: 687 (Dec.) 1931. (*c*) Foulger, Margaret; Glazer, A. M., and Foshay, Lee: Tularemia: Report of Case with Postmortem Observations and Note on Staining Bacterium Tularense in Tissue Sections, J. A. M. A. **98**: 917 (March 19) 1932. (*d*) Blackford, S. D.: Pulmonary Lesions in Human Tularemia: Pathologic Review and Report of Fatal Case, Ann. Int. Med. **5**: 1421 (May) 1932. (*e*) Gudger, James: Tularemic Pneumonia: Report of Case, J. A. M. A. **101**: 1148 (Oct. 7) 1933. (*f*) Gundry, L. P., and Warner, C. G.: Fatal Tularemia: Review of Autopsied Cases, with Report of a Fatal Case, Ann. Int. Med. **7**: 837 (Jan.) 1934.

2. Archer, V. W.; Blackford, S. D., and Wissler, J. E.: Pulmonary Manifestations in Human Tularemia: A Roentgenologic Study Based on Thirty-Four Unselected Cases, this issue, p. 895.

TULAREMIC PNEUMONIA

Physical and roentgenologic signs of pulmonary consolidation were detected in seven cases (20 per cent of the entire series). In this group the diagnosis of tularemia was difficult because the usual clinical criteria were often lacking. Tularemia was suspected in one instance (case 34) from the history and from bilateral ulceroglandular lesions that occurred before the pneumonia. It was proved subsequently by the agglutination test. In another (case 10), enlargement of the cervical glands appeared several days after the pneumonia was detected, but the diagnosis of tularemia was not made until a biopsy of these glands two months later suggested the repetition of the agglutination. Ulceroglandular lesions were not apparent in the remaining five patients of this group, and the diagnosis of tularemia was based on agglutination tests made because of fevers of unknown origin (cases 1, 5 and 26) or because of chest conditions of unproved etiology (cases 28 and 30).

The symptoms of pneumonia in this group were variable and in general were less severe than those seen in ordinary pneumonia. All seven patients had some degree of cough, but usually it was not serious. There was no rusty sputum. The sputum was profuse and bloody in one instance (case 5), in which there was also a lung abscess. Chest pain was absent in five, but it was severe in two (cases 1 and 28). Some patients had chills at the time of the onset of tularemic symptoms, but chills were absent at the beginning of the pneumonia. In four patients (10, 26, 28 and 34), bronchitis preceded or was associated with the consolidation. The physical signs were those usually found in pneumonia and in most cases they were lobular in distribution; however, in at least one (case 28), the involvement was both lobular and lobar. In cases in which the time of consolidation could be determined, it was detected on the second, fifth, sixth, eighth, eighth and sixteenth day after the tularemic infection. The physical signs persisted for from a few days to three weeks. The temperature fluctuated from 103 to 106 F., and in those patients who survived, the fever remained after the disappearance of signs. The pulse rate was remarkably slow in relation to the fever; in no case was it consistently faster than 110. Rapid respiration and cyanosis were noted only in the terminal stages of the fatal cases. The leukocyte count was within the limits of normal with the exception of one case (case 10). Three (patients 5, 26 and 34) of these seven patients died.

Detailed reports of case 5[1d] and of case 30[2] will be found elsewhere. The other five cases of tularemic pneumonia (cases 1, 10, 26, 28 and 34) are presented here with the primary emphasis on the pulmonary involvement:

CASE 1.—A farmer, aged 34, admitted, July 25, 1927, complained of nausea, vomiting, backache and prostration of eight days' duration. Routine studies revealed nothing except a temperature of 102.8 F. In view of the season, the fever and the normal leukocyte count, treatment for typhoid was instituted. August 8, pleurisy developed on the left and three days later typical signs of pneumonic consolidation were noted. August 12 a roentgenogram confirmed the diagnosis of pneumonia. The fever began to subside August 16 and was gone by the 20th. The patient was discharged, September 7, with a diagnosis of typhoid in spite of repeated negative Widal tests and of many negative cultures of the blood, urine and stool for typhoid bacilli.

The subsequent recognition of a case of tularemia caused this patient to be recalled for an agglutination test, Feb. 7, 1928, which was positive (1:80). Roentgen films in 1928 and 1933 have revealed marked fibrosis in the chest.

CASE 10.—A feebleminded boy played with the skin of a freshly killed squirrel, Nov. 28, 1929. The next day he had four convulsions and was admitted to the hospital that night in a convulsive state, with a temperature of 105 F. Dulness and increased whispered voice were noted in the left apex. Laboratory studies, which included agglutination tests for typhoid, undulant fever and tularemia, as well as lumbar puncture, were essentially negative. The leukocyte count was 14,000. December 9 a roentgenogram revealed pneumonic infiltration with apparently central softening in the left upper lobe. During his first weeks in the hospital the boy presented a wide variety of symptoms. Pus was aspirated from a deep cervical abscess, which developed about December 15.

Necropsy.—Four hundred cubic centimeters of fluid and, apparently, pneumothorax were found on the left. Fibrinous exudate covered the pleura on both sides and there was extensive purulent involvement of the tracheobronchial glands. Small pneumonic patches with a few minute zones of necrosis were present in the left upper lobe. The left lower lobe was almost completely consolidated, with a central cavity, 3 cm. in diameter, connecting with a bronchus. The right upper lobe was in an earlier stage of consolidation. Several small zones of focal necrosis were noted in the right middle and lower lobes. Bacterium tularense was recovered from animals inoculated with macerated lung tissue.

CASE 28.—A farmer, aged 68, began to have "dizzy spells," July 26, 1933. A sharp pain in the right side of the chest with chills, fever, nausea and vomiting began the following day. Because of these symptoms he was admitted, July 31. He had no respiratory symptoms other than the chest pain.

TABLE 1.—*Data Relative to Individual Tularemic Infections*

Case*	Sex	Race	Age	Occupation	Type of Tularemia†	Source of Inoculation	Incubation, Days	Chief Complaint on Admission	Duration of Chief Complaint, Days	Initial Indication for Agglutination Reaction	Maximum Agglutination Titer	B. Tularense Found	Fatal	Autopsy
1	♂	W	34	Farmer	T.	?	?	Fever	8	Fever	1/80	..	..	..
2	♂	W	18	Student	T.	Rabbit	2	Fever	3	Patient's request	1/320	..	..	..
3	♂	W	63	Banker	U.G.	Rabbit	1	Fever	10	History	1/640	..	..	..
4	♂	N	54	Farmer	U.G.	Rabbit	7	Glands	23	Ulcer and glands	1/160	..	..	..
5	♂	N	38	Farmer	T.	Opossum	4	Cough (acute)	30	Fever	1/5,280	..	+	+
6	♀	N	63	Housewife	U.G.	Rabbit	7	Ulcer	14	Ulcer and glands	1/160	..	..	..
7	♂	W	19	Student	U.G.	Rabbit	5	Gland	56	Gland biopsy	1/160	..	..	..
8	♂	N	27	Farmer	U.G.	Tick ?	?	Hematuria	1	Fever	1/160	..	..	..
9	♀	W	57	Housewife	U.G.	Tick ?	?	Fever	8	Fever	1/160	..	..	..
10	♂	W	15	None	G.	Squirrel	1	Convulsions	1	Gland biopsy	1/160	..	..	..
11	♀	W	46	Housewife	U.G.	Rabbit	4	Ulcer	7	Ulcer and glands	1/160	..	..	..
12	♀	W	25	Housewife	U.G.	Rabbit	2	Ulcer	3	Ulcer	1/1,280	..	..	..
13	♀	W	38	Housewife	U.G.	Rabbit	2	Arthritis	25	History	1/640	..	..	..
14	♂	W	51	Painter	U.G.	Rabbit	?	Cough (chronic)	900	Ulcer and glands	1/160	..	..	..
15	♂	N	9	Student	U.G.	Tick	2	Fever	4	Fever	Negative	+	+	+
16	♂	W	21	Farmer	T.	?	?	Fever	5	Fever	1/320	..	..	..
17	♂	W	31	Farmer	U.G.	?	?	Fever	14	Fever	1/1,280	..	..	..
18	♀	N	12	Student	O.G.	Rabbit ?	2	Conjunctivitis	3	Conjunctivitis	1/1,280	+	..	..
19	♀	N	41	Housewife	U.G.	Rabbit	?	Gland	45	Gland	1/640	..	..	..
20	♂	W	11	Student	U.G.	Rabbit	2	Gland	29	Gland	1/640	..	..	..
21	♂	W	4	None	U.G.	Rabbit	2	Gland	29	Gland	1/640	..	..	..
22	♂	W	8	Student	U.G.	Rabbit	2	Gland	29	Gland	1/1,280	..	..	..
23	♂	N	54	Farmer	U.G.	Rabbit	3	Glands	25	Glands	1/1,280	..	..	..
24	♀	W	25	Housewife	U.G.	?	?	Jaundice	120	History	1/640	..	..	..
25	♀	N	50	Housewife	U.G.	Rabbit	?	Gland	50	Gland	1/640	..	..	..
26	♂	W	23	Farmer	T.	Rabbit	1	Fever	6	Fever	1/80	+	+	+
27	♂	W	8	None	O.G.	?	?	Conjunctivitis	7	Conjunctivitis	1/80	..	..	..
28	♂	W	68	Farmer	T.	?	?	Pain in chest	4	Chest condition	1/320	..	..	..
29	♂	N	9	Student	U.G.	Rabbit	?	Gland	19	Gland	1/640	..	..	..
30	♂	N	19	Farmer	T.	Rabbit	2	Fever	3	Chest condition	1/160	..	..	..
31	♀	W	15	Student	U.G.	Tick ?	?	Gland	38	Gland	1/160	..	..	..
32	♀	N	10	Student	U.G.	Rabbit	3	Ulcer	3	Ulcer	1/160	..	..	..
33	♂	W	38	Clerk	U.G.	Rabbit	2	Chronic peritonitis	330	History	1/160	..	..	..
34	♀	W	42	Housewife	U.G.	Rabbit	5	Fever	3	Ulcer and glands	1/160	..	+	..
35	♂	N	18	Student	T.	?	?	Dyspnea	90	Chest condition	1/320	..	..	..

* The first thirteen cases have already been reported briefly (Blackford, S. D.: Virginia M. Monthly **58**: 10 [April] 1931). Cases 15, 19, 30 and 35 are being reported by Archer, Blackford and Wissler.[2] Cases 5 and 23 have been reported in detail (Blackford:[1d] Virginia M. Monthly **60**: 167 [May] 1933). Cases 20, 21 and 22 have been reported by W. W. Waddell Jr. and W. O. Wills (J. Pediat. **2**: 187 [Feb.] 1933).

† T., typhoidal; U.G., ulceroglandular; G., glandular; O.G., oculoglandular.

Jan. 15, 1930, a cervical gland was removed for diagnosis. Discovering no acid-fast organisms, the surgical pathologist suggested a second agglutination test for tularemia. This was positive (1:160) on January 30, which was the first day without fever. He was discharged, February 9. He was readmitted in May on account of bilateral conjunctivitis, the cause of which could not be determined. No recent information about this patient has been obtainable.

CASE 26.—A farmer, aged 24, skinned a rabbit during the afternoon of June 30, 1933. The next morning as he started to work he fainted and later he became feverish with headache, weakness and anorexia. He was admitted, July 5, with cough, prostration and a temperature of 105 F. Generalized bronchitis was found on physical examination, but the routine laboratory studies were negative. July 9, signs of consolidation were noted in the left lower lobe. A roentgenogram on July 11 showed consolidation from the second to the fifth rib with a central area of rarefaction about 3 by 5 cm. on the left and infiltration in the second interspace on the right. Three days later, physical signs of extensive bilateral consolidation were present and the agglutination test was positive for tularemia (1:80). The patient died suddenly the next day.

Chest examination revealed atypical signs of either fluid or consolidation in the right side of the chest posteriorly. The temperature was 103.2 F. Two days later, thoracentesis was attempted but no fluid was found. August 3, the chest signs were definitely those of pneumonia. On the 8th, tularemic agglutination, taken because of the typical character of the chest condition, was positive (1:40); the titer increased to 1:320 in later examinations. In roentgenograms of the chest made on the 22d, after the physical signs had disappeared, evidence of pneumonia in the right base was still visible. The patient was discharged, August 27. Chest films in January 1934 showed residual signs of bronchitis.

CASE 34.—A housewife, aged 42, dressed a rabbit, Nov. 2, 1933. Three days later she went to bed with chills, fever and headache. She was admitted, November 10, with a temperature of 104 F. Multiple bilateral ulcerations on the hands and bilateral epitrochlear and axillary adenopathy were obvious. There were a few râles in the right hilus area but no respiratory symptoms. The laboratory studies were unimportant. Roentgen films on admission revealed great enlargement of the right hilus. Definite physical signs of pneumonia were first found on November 15. In the roentgenograms of the 18th,

a further increase in the enlargement of the right hilus with a surrounding pneumonic area was noted and there was a small area of necrosis near the hilus. The patient became increasingly toxic and died, November 19. A blood specimen obtained after death gave the first positive agglutination for tularemia (1:160).

TULAREMIC BRONCHITIS

Clinical bronchitis was diagnosed in twelve cases. In only seven of these twelve was the bronchitis uncomplicated. These seven patients gave typical contact histories and exhibited the ulceroglandular lesions of tularemia.

All these patients had a moderate to severe cough, generally beginning within a week of the tularemic inoculation and continuing for from a few days to more than thirty months. In four cases (3, 14, 19 and 23) the cough was unproductive. None of the patients experienced chest pain. The dyspnea recorded in one instance (case 3) was probably of cardiac origin. Râles were heard in every case; they were localized and rather fine in some instances, generalized and coarse in others. In two cases (3 and 19) there were physical signs suggestive of consolidation but the suspicion of pneumonia could not be confirmed by roentgen studies. Patients 3 and 14 had high and protracted fevers; the other five were treated in the outpatient clinic after mild febrile reactions at home.

Acute and chronic bronchitis are illustrated by the reports of the two patients (3 and 14) who were hospitalized:

CASE 3.—A banker, aged 63, skinned a rabbit, Nov. 16, 1927. The next day he complained of fever, headache and weakness. He was admitted November 27 with a fever of 103.6 F., prostration, productive cough, headache and periods of delirium. Scattered patches of fine râles were heard under the left scapula, and a tentative clinical diagnosis of bronchopneumonia was made. Roentgen study on the 30th revealed bronchial changes in this area, but pneumonic infiltration was indefinite. The fever subsided about two weeks after admission. Agglutination tests for tularemia became increasingly positive to a titer of 1:640. The patient was discharged, Jan. 2, 1928. He died of accidental injuries, April 28, 1929.

CASE 14.—A house painter, aged 51, skinned a rabbit in October 1927. A few days later he noticed an ulcer on the hand and glands in the axilla. He was confined to bed for ninety-three days on account of febrile symptoms and a severe cough. The cough persisted after convalescence and was so severe that the patient had to stop working. Nov. 17, 1929, the patient said that he "coughed up about a cupful of bloody sputum" during one twenty-four hour period. Following this, similar episodes occurred several times a month and in addition he suffered from dyspnea, chest pain and tiring easily. However, all these symptoms gradually improved until the time of his admission. He entered the hospital, April 15, 1930, because he thought he had tuberculosis. A few scattered small and medium moist râles were heard in the left apex anteriorly, and a questionable clubbing of the fingers was noted. Roentgen study of the chest revealed enlargement of both hilus zones and many discrete areas of calcium deposit, but there was no evidence of active tuberculous infection. Sputum examinations for acid-fast organisms were negative. Tularemic agglutination was positive (1:160). The patient left the hospital against advice two days after admission and no subsequent information has been obtainable.

TABLE 2.—*Respiratory Symptoms, Physical Signs and Roentgen Diagnoses*

	Respiratory Symptoms				Physical Signs				Roentgen Diagnoses									
Case	Cough	Sputum	Chest Pain	Dyspnea	Time Signs Found After Inoculation	Consolidation	Bronchitis	Pleurisy or Pleural Fluid	Time Film Taken After Inoculation	Normal	Pneumonia	Necrosis	Peribronchial Thickening	Pleural Fluid	Apparent Excess of Calcium	Nodular Infiltration	Abnormality Undetermined	Number of Films Taken
1	1+	...	3+	...	16 days	+	..	+	28 days	..	+	..	x*	..	..	..	..	3
2	2+	1+	3+	1+	18 days	+	+	+	59 days	..	?	..	x	?	x*	..	..	3
3	2+	2+	...	1+	11 days	?	+	..	14 days	..	?	..	+	..	..	..	..	1
4	2+	...	...	...	37 days	..	+	..	64 months	..	..	..	+	..	+	..	..	1
5	3+	3+	...	...	32 days	+	..	?	36 days	..	+	+	..	..	..	..	..	1
6	2+	...	...	...	19 days	..	+	..	61 months	..	..	..	..	..	..	..	+	1
7	...	..	...	...	.....	..	..	..	60 months	..	..	..	+	..	..	..	..	1
8	...	...	...	...	.....	..	..	..	.....	..	..	..	..	..	..	..	..	0
9	...	...	...	...	.....	..	..	..	53 months	..	..	..	+	..	..	..	..	1
10	1+	...	...	...	2 days	+	+	..	12 days	..	+	?	..	..	..	..	..	1
11	...	...	...	...	.....	..	..	..	44 months	..	..	..	+	..	..	..	..	1
12	1+	...	1+	1+	35 days	?	..	+	21 days	..	..	..	x?	+	..	..	..	3
13	...	...	...	...	.....	..	..	..	39 months	..	..	..	+	..	+	..	..	1
14	3+	2+	...	...	30 months	..	+	..	30 months	..	..	..	+	..	+	..	..	1
15	...	...	...	...	.....	..	..	..	9 days	..	..	..	..	..	..	+	..	1
16	...	...	...	...	.....	..	..	..	17 days	..	..	..	+	..	x	..	..	3
17	...	...	...	...	.....	..	..	..	16 days	..	..	..	x	..	+	..	..	2
18	...	...	...	...	.....	..	..	..	25 months	..	..	..	..	..	+	..	..	1
19	2+	1+	...	...	48 days	?	+	..	56 days	..	..	..	+	..	..	..	..	1
20	...	...	...	...	.....	..	..	..	9 months	..	..	..	+	..	+	..	..	1
21	...	...	...	...	.....	..	..	..	9 months	..	..	..	+	..	+	..	..	1
22	...	...	...	...	.....	..	..	..	9 months	+	..	..	..	..	..	..	..	1
23	2+	1+	...	...	6 days	..	+	..	12 months	..	..	..	+	..	+	..	..	1
24	...	...	...	...	.....	..	..	..	14 months	..	..	..	..	..	+	..	..	1
25	1+	...	...	...	40 days	..	+	..	12 months	+	..	..	..	..	..	..	..	1
26	3+	1+	2+	...	6 days	+	+	?	12 days	..	+	+	..	..	..	..	..	1
27	...	...	...	...	.....	..	..	..	11 days	+	..	..	x	..	x	..	..	2
28	2+	1+	2+	...	8 days	+	+	?	35 days	..	+	..	..	..	x?	..	..	3
29	...	...	...	...	.....	..	..	..	4 months	..	..	..	..	..	+	..	..	1
30	1+	...	...	...	5 days	+	..	..	7 days	..	+	..	x	..	..	..	..	3
31	...	...	...	...	.....	..	..	..	42 days	..	..	..	+	..	..	..	..	1
32	...	...	...	...	.....	..	..	..	21 days	..	..	..	+	..	..	..	..	1
33	...	...	...	...	.....	..	..	..	11 months	..	..	..	+	..	+	..	..	1
34	1+	...	...	...	8 days	+	+	..	8 days	..	+	+	..	..	..	..	..	6
35	2+	...	3+	3+	3 months	..	..	+	3 months	..	..	..	..	+	..	..	..	1
	17	8	6	4		11	12	7		3	9	4	21	3	15	1	1	

* x indicates a roentgen finding not apparent in the first films but present in a subsequent film.

TULAREMIC PLEURAL EFFUSION

A diagnosis of pleural effusion was made in four cases in this series. Pleural effusion was found once at necropsy in a pneumonic case (case 26); the diag-

nosis in the other three (cases 2, 12 and 35) was made during life and the fluid aspirated and studied. In these three surviving cases the diagnosis of tularemia was obvious once (case 12) from history and ulceroglandular lesions; but tularemia was not apparent in the other two (cases 2 and 35). Patient 2 was thought for two years to have tuberculosis of the pleura and lung. The diagnosis of tularemia was finally made when the patient requested an agglutination test after reading about the disease in the newspapers. The other was believed to have a tuberculous effusion until tularemia was proved by the routine agglutination test for an obscure condition of the chest.

These three patients had cough, which was productive in one instance (case 2). Chest pain was severe in two (cases 2 and 35) and mild in one (case 12). There was marked dyspnea in one (case 35) and slight dyspnea in the other two (cases 2 and 12). Patient 2 had physical signs of bronchitis, pleural fluid and consolidation. Another (patient 12) had probable consolidation in addition to the effusion. The third patient (35) was admitted for the removal of fluid from the left side of the chest and reported that fluid had been aspirated from the right side of the chest three months previously.

High fevers, relatively slow pulse rates and normal leukocyte counts characterized all three cases.

The pleural fluid in each instance was slightly cloudy and straw colored. The specific gravities varied from 1.022 to 1.042, the total protein in the fluid from 4.5 to 5.6 per cent. The highest cell count was 3,400. Lymphocytic cells predominated in all the differential counts. No acid-fast organisms were identified in the stained smears and no evidence of tuberculosis was obtained from guinea-pig inoculations. Efforts to isolate B. tularense from the fluids by animal inoculation and culture, made in two instances (cases 12 and 35), were unsuccessful; the same fluids, however, agglutinated the organism in high dilutions.

Case 35 is reported in detail elsewhere.[2] The other two are presented here:

CASE 2.—A schoolboy, aged 19 years, admitted, Aug. 17, 1927, had a fever of 103.8 F. He had been sick three days with chills, fever and a pain in the right side of the chest. Physical examination and laboratory studies were essentially negative. Owing to the season and a high fever with a normal leukocyte count, a tentative diagnosis of typhoid was made in spite of the fact that the patient had recently completed a series of typhoid inoculations. During the first ten days in the hospital a moderate cough with dyspnea developed, and on August 27 numerous diffuse squeaks were heard in both lungs. The following day an extensive pleural and pleuropericardial rub was present over the left side, and it was thought that there were also signs suggestive of consolidation. By the 31st, the rub was replaced by signs of fluid. Aspiration on this date removed 10 cc. of a slightly cloudy straw-colored fluid with a specific gravity of 1.042 and a total protein content of 4.5 per cent. There were 90 per cent small lymphocytes in the differential smear. No acid-fast organisms were found, and a guinea-pig was inoculated but subsequently lost. September 1, therapeutic thoracentesis removed 850 cc. of similar fluid. Definite signs of multiple small areas of consolidation were found in both lungs on the 6th. The high fever began to subside about ten days later. No definite evidence of fluid was seen in the first roentgen films, taken on the 29th, but it was thought that there was evidence of tuberculosis in the parenchyma of the lung. The patient was sent to a tuberculosis sanatorium, October 25, with a diagnosis of tuberculous pneumonia and tuberculosis of pleura, in spite of the fact that repeated sputum examinations for acid-fast organisms had been negative. The patient was discharged from the sanatorium in June 1928, after gaining 40 pounds (18 Kg.). He returned to the hospital, Jan. 15, 1930, asking that a blood test for "rabbit sickness" be done because he remembered having skinned a sick rabbit a few days before his first admission to the hospital. The agglutination was positive (1:320). Peribronchial infiltration was seen in roentgen films taken in October 1933.

CASE 12.—A housewife, aged 25, skinned a rabbit, April 9, 1930. Two days later there was a sudden onset of fever, accompanied by aching, nausea, vomiting and a hacking cough. She was admitted, April 14, with a fever of 103.2 F. Ulceroglandular lesions were found and a tentative diagnosis of tularemia was made. Chest examination and laboratory studies were negative. Tularemic agglutination on April 28 was positive (1:1,280). A roentgen film of the chest on the 30th indicated probable bronchiectasis in the right base. May 6, local roentgen therapy to the ulcer and glands was instituted with some relief of symptoms. Defervescence began on the 8th, but daily examinations of the chest were continued. Signs of fluid in the right base were definite by the 14th. A roentgen film on this date revealed an increase in the density previously noted, but it was thought that there was insufficient evidence to warrant a diagnosis of pleural effusion. On the 17th a diagnostic thoracentesis removed 400 cc. of slightly cloudy straw-colored fluid with a specific gravity of 1.022 from the right pleural space. This exudate contained 3,400 cells per cubic millimeter, with 72 per cent lymphocytes in the differential count. No acid-fast organisms were found and guinea-pig inoculations were negative for both tuberculosis and tularemia. B. tularense was not recovered in the special mediums used, but the fluid agglutinated the organism (1:640). The patient was discharged, May 23. A roentgen film in September 1933 revealed a moderate increase of the lung markings in the right base.

COMMENT

Tularemia has been shown to affect the thoracic viscera in a high percentage of cases which came to necropsy, but this study demonstrates for the first time that pleuropulmonary infections are frequent in patients who recover from the disease. Clinical methods detected lung or pleural involvement in approximately half of this unselected series, and roentgenograms revealed abnormalities in the chest in more than 90 per cent.

Physical and roentgenologic examinations established the presence of consolidation in one fifth of this entire series and, of those patients who were first seen within forty days of the onset of tularemia, pneumonia was found in one fourth. These figures may not represent the true frequency of pulmonic consolidations in all tularemic infections, since in rural areas only the most severe cases are hospitalized. On the other hand, these data indicate that pneumonia is a much more common manifestation of tularemia than would be expected from the fact that only three cases[3] have been published under the name of "tularemic pneumonia." This study points out further that, while pneumonia is one of the most serious manifestations of tularemia, it is not so fatal as is generally believed. Only two recoveries[4] after consolidation in tularemia have been reported. Four of these seven patients with proved consolidation survived. There was no definite proof of lung necrosis in any of these surviving patients. Conclusive roentgenologic evidence of "central softening" in the consolidated areas was found in each of the three fatal cases. This "central softening" represented cavitation

3. Permar and Maclachlan.[3b] Gudger.[3c] Tureen, L. L.: Tularemic Pneumonia, J. A. M. A. **99**: 1501 (Oct. 29) 1932.

4. Sante, L. R.: Pulmonary Infection in Tularemia: Case Report, Am. J. Roentgenol. **25**: 241 (Feb.) 1931. Tureen.[3]

in the two patients who came to necropsy. The pathologic studies in these two instances were entirely consistent with the observations reported in tularemic pneumonia.

Bronchitis alone or in conjunction with other pulmonary disease was found clinically in more than one third of this series, and there was roentgenologic evidence of peribronchial thickening in three fifths of all the patients. The prognosis was not serious when bronchitis alone was present. Patients in whom clinical bronchitis was uncomplicated were usually no more ill than those without clinical indications of respiratory involvement, and none of them died. In the absence of necropsy studies of uncomplicated cases it could not be proved that the bronchial changes resulted from tularemia and not from secondary infection. However, inflammation of the bronchi was found in an unconsolidated portion of the lung in one of the patients dying of tularemic pneumonia, and this finding suggests that the bronchitis was also due to tularemia. The frequency with which bronchitis followed tularemic infection is a further indication that it was a part and not a complication of the disease.

Fluid in the pleural cavity was found in four of these thirty-five cases. In three instances it was associated with physical signs of pneumonia. The exudate was aspirated for diagnostic examination in three of these four patients. These exudates were strikingly similar on routine laboratory study to the exudates found in tuberculous effusion, but two of the fluids agglutinated B. tularense, and tubercle bacilli were demonstrated in none of them. The effusions were presumably due to tularemia, since previous and present necropsy studies have shown that pleural fluid may be associated with pneumonia of definitely tularemic origin.

Gudger [1] has called attention to the fact that pulmonary lesions are prominent in certain cases of the typhoidal type of tularemia and that these pulmonary manifestations are often diagnosed with difficulty. These statements were confirmed in this study. Seven of the eight patients with the typhoidal type of infection had serious pulmonary lesions. The chest symptoms and signs were outstanding in these cases and the diagnoses of tularemia were made only by agglutination tests. When tularemia is not recognized as the cause of the respiratory involvement, diagnoses of tuberculosis or of bronchopneumonia may be made erroneously.

In regions in which tularemia is prevalent, the disease should be considered when suspected pulmonary tuberculosis cannot be proved. Tularemia agglutinations should be obtained also in all atypical pneumonias, particularly if they are accompanied by a high fever with a relatively slow pulse rate and a relatively low leukocyte count. It has been a local custom in the past year to secure tularemic agglutinations in all unusual chest conditions, and three of the present cases were recognized as tularemia only as a result of this routine procedure.

SUMMARY

Thirty-five consecutive cases of tularemia were reviewed with reference to the pleuropulmonary manifestations of the disease during life. Clinical evidences of such involvement were found in seventeen of the thirty-five cases. Pneumonia was proved by physical and roentgenologic examinations in seven instances (20 per cent of the entire series); clinical bronchitis alone, as evidenced by cough and râles without other signs, was found in seven other patients (20 per cent), and pleural fluid was aspirated from three patients (8.6 per cent).

PULMONARY MANIFESTATIONS IN HUMAN TULAREMIA

A ROENTGENOLOGIC STUDY BASED ON THIRTY-FOUR UNSELECTED CASES

VINCENT W. ARCHER, M.D.
STAIGE D. BLACKFORD, M.D.
AND
JAMES E. WISSLER, M.D.
UNIVERSITY, VA.

Thirty-five cases of tularemia have been recognized at the University of Virginia Hospital since 1927. Thirty-four of the diagnoses have been confirmed by characteristic agglutination reactions, the remaining one by recovery of the organism after death.

Roentgen study of the chest had not been made in a single case in this series prior to the tularemic infection. Chest films have been taken in thirty-four of the thirty-five cases at some time subsequent to the inoculation. Roentgenograms of the chest were obtained in eighteen patients during the active stage of the disease (i. e., within three months of inoculation), eight of these returning after recovery for further roentgen examination. Chest films after recovery were made in sixteen of the remaining cases. It is unfortunate that films were not obtained during the active stage of the disease in all the cases, but it was not until late in this series that it was realized that positive pulmonary changes are so uniformly present. In recent cases, early and serial films are made as a routine.

PULMONARY MANIFESTATIONS IN ACTIVE TULAREMIA

The roentgen films in this group have been reviewed and interpreted in accordance with the following classification:

Pulmonary consolidation, seven.
Peribronchial thickening, seven.
Pleural effusion, three.
Nodular infiltration, one.

PULMONARY CONSOLIDATION

Tularemic pneumonia has been described in ten of the fourteen complete routine necropsy reports quoted by Gundry and Warner.[1] It appears to be primarily a bronchopneumonia with a lobular type of involvement, often accompanied by areas of focal necrosis. Confluence of the lobules may lead to large areas of caseous consolidation, in which cavitation may be found if secondary infection is present.

Roentgen studies of tularemic pneumonia give results in accord with its known pathologic changes, but the diagnosis cannot be made by chest films alone. The pathologic process was followed in one patient (patient 34) dying on the sixteenth day after infection, by

From the Departments of Roentgenology and Internal Medicine, University of Virginia Hospital.

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1. Gundry, L. P., and Warner, C. G.: Fatal Tularemia: Review of Autopsied Cases, with Report of a Fatal Case, Ann. Int. Med. **7**: 837 (Jan.) 1934.

serial roentgenograms from the seventh to the fifteenth day. The first films revealed a great enlargement at the right hilus, which subsequently increased and was surrounded by pneumonic infiltration. Central necrosis in the hilus region was visible on films taken the day before death. An autopsy permit was refused in this case. In the other two fatal cases (cases 5 and 26), however, necropsy examination confirmed the roentgen interpretation of necrosis; one presented an area of central softening in the midst of an extensive pneumonia, and the other presented consolidation with multiple abscess formation. Three surviving patients gave roentgen evidence of infiltration without rarefaction, and these patients have been roentgenologically studied since recovery: one had practically no residual change six weeks later, one had a thickening of the bronchial tree after five months, and one had marked fibrosis after five years. Roentgenograms in the fourth surviving patient revealed definite pneumonia with what appeared to be central softening. Follow-up films could not be obtained in this case.

One of the necropsies (case 5) has been reported already in detail and a second one (case 26) will be reported elsewhere.

One illustrative report presents the salient features of pulmonary consolidation:

CASE 30.—H. W., a Negro farmer, aged 19, picked up a dead rabbit, Aug. 24, 1933. Two days later there was a sudden onset of fever, headache and malaise. He was admitted, August 29, on account of a general toxic condition, fever of 103.6 F., vomiting, abdominal pains and a slightly productive cough. The physical examination and laboratory studies were negative except for suppression of breath sounds and showers of moist râles in the left side of the chest, anteriorly. A pneumonic area from the second to the fifth rib on the left was seen in a roentgenogram (fig. 1) made August 31. Definite physical signs of pneumonia were found September 1. The patient became afebrile September 3. A routine agglutination test for tularemia was positive in a titer of 1 to 160 on September 4. Almost no residual change was discernible in chest films made on September 9. The patient was discharged on September 10. He returned by request on October 7 for further roentgen examination. There had been apparently some increase in the calcium deposit in the right hilus zone (fig. 2).

PERIBRONCHIAL THICKENING

The correlation between the tularemic necropsy material and the roentgen appearance of peribronchial thickening can be made only by deduction. The necropsy studies in tularemic pneumonia show that it is primarily lobular in type, which implies that the inflammatory process begins in and around the bronchi. If this process does not proceed to consolidation, the inflammatory changes should produce the picture of peribronchial thickening in roentgen films. This roentgenologic finding may represent bronchitis, peribronchitis, fibrosis or a combination of the three.

An uncomplicated increase in peribronchial markings was noted in the films in seven active cases (cases 3, 16, 17, 19, 27, 31 and 32) of this series. There was usually some haziness in addition to the thickening in these active cases, and it was thought to represent an acute bronchitis or peribronchitis rather than a simple fibrosis.

The report of one case with both clinical and roentgen evidence of bronchitis will suffice for illustration:

CASE 19.—E. P., a Negro woman, aged 41, a housewife, skinned rabbits frequently during the fall of 1931. About November 25 she accidentally cut her right index finger, and this was followed by a "waxing kernel in the armpit" and a "severe cold," the symptoms of which consisted of feverishness, chills, malaise, weakness, nasal discharge and a cough. Although she was quite sick, she did not go to bed. She came to the outpatient department, Jan. 11, 1932, complaining of axillary enlargement. A few râles and signs suggestive of consolidation were found in the right posterior hilus region. Tularemic agglutination, taken January 14, was reported positive in dilutions up to 1 to 640. Roentgen films (fig. 3) January 20 revealed thickening of the lung markings, most marked in both hilus regions. No subsequent data could be obtained.

PLEURAL EFFUSION

Fluid in the pleural space has been reported in three of fourteen tularemic necropsies. Verbrycke mentioned the presence of 100 cc. in each pleural cavity in association with pneumonia. Goodpasture and House found 200 cc. in one pleural sac but discovered no evidence of intrapulmonary involvement. Bunker and Smith recorded finding 840 cc. in one pleural cavity and noted that, in addition to pneumonic consolidation of this lung, there were six or eight white areas on the surface, which did not extend into the lung substance. One of the fatal cases (case 26) of our series presented a probable pneumohydrothorax, with 400 cc. of fluid. These observations prove that tularemia must be considered as a rare but possible cause of pleural effusions.

The roentgen examinations of the chests in our series were of no assistance in identifying the tularemic nature of the effusions. One case serves to illustrate:

CASE 35.—S. H., a Negro schoolboy, aged 18 years, admitted to a hospital in Washington, Sept. 30, 1933, had a "cold" and pain in the right side of the chest of two weeks' duration. There were definite signs of fluid in the right base and a thoracentesis removed fluid, but there is no record of the amount or nature of this fluid. A roentgen film was taken just before his discharge, November 10, which was considered to be negative except for some thickening of the pleura on the right side. The boy returned to his home feeling somewhat weak and with a persistent cough but was otherwise in fairly good health until December 23, when he was suddenly awakened by a severe inspirational pain in the right side of the chest, which lasted off and on for about a week. His local physician made a diagnosis of pleurisy with effusion and kept him in bed until dyspnea and a temperature of 104.4 F. necessitated admission to this hospital, Jan. 4, 1934. Signs of a large amount of fluid in the left side of the chest were found on examination. The patient was greatly relieved by the removal of 500 cc. of fluid, January 6. No acid-fast organisms could be stained. Guinea-pig inoculation was negative for tuberculosis. January 8, an additional 600 cc. of fluid was aspirated. In view of the high fever with a low leukocyte count, a diagnosis of tuberculous effusion seemed most likely, even though several sputum examinations were negative for acid-fast organisms. A tularemic agglutination taken as a routine, January 9, was reported positive in dilutions of 1 to 320. January 11, 75 cc. of fluid was removed and an unsuccessful effort made to recover Bacterium tularense by animal inoculation and cultures of this fluid. However, the fluid agglutinated the organism in dilutions of 1 to 160. Immediately after this aspiration, anteroposterior (fig. 4) and lateral films were made, which showed a massive hydrothorax in the posterior portion of the left side of the chest. There was a slight haziness and increase in the lung markings of the right side of the chest. The patient was almost afebrile and practically free from symptoms at the time of his discharge, Jan. 14.

NODULAR INFILTRATION

Lesions of peribronchial and bronchial lymph nodes have been recorded in three of the fourteen tularemic necropsies. This glandular involvement may be independent of lesions in the lung, since in one instance no

intrapulmonary change was observed. Lymphadenitis in the hilus region was noted in the three necropsies of our series, and it was found roentgenologically in the fourth fatal case. It seems probable that enlargement of the hilus glands is a frequent occurrence in severe tularemic infections.

Tularemic involvement of the hilus glands may be mistaken in roentgenograms for the puerile type of tuberculosis, as is demonstrated by the following case, which will be reported elsewhere in more detail:

CASE 15.—M. T., a Negro schoolboy, aged 9 years, was bitten in the left axilla by a tick, June 29, 1931. Two days later he was taken violently ill with fever, headache, weakness and prostration. He was admitted, July 5, with a fever of 104.5 F. The most conspicuous finding on physical examination was suppuration from a gland in the left axilla the size of a pigeon egg. There were no respiratory signs or symptoms. Nothing abnormal was found in complete laboratory studies, which included the routine agglutinations for unexplained fevers. A chest film (fig. 5) was made July 7, and a marked increase of the lung markings in the mesial half of both lungs was noted. These increased markings were more pronounced on the right side, and they appeared to be primarily an enlargement of the hilus nodes. It was thought that these manifestations represented a massive tuberculous involvement of the simple puerile type. The patient became progressively more toxic and died, July 9. Necropsy revealed tubercle-like areas in the right lung, bronchial lymph nodes, spleen and liver. A few minute areas of focal necroses were found in the microscopic study of the lungs. Bacterium tularense was isolated by the U. S. Hygienic Laboratory from a guinea-pig inoculation with a postmortem specimen of blood.

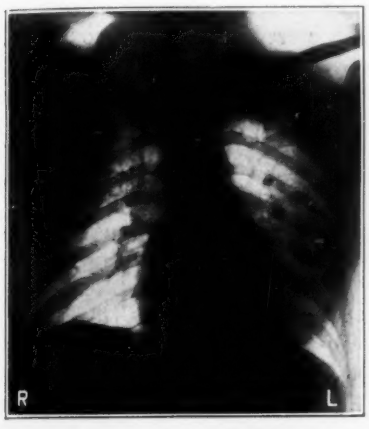

Fig. 1.—Pneumonic consolidation in the left base.

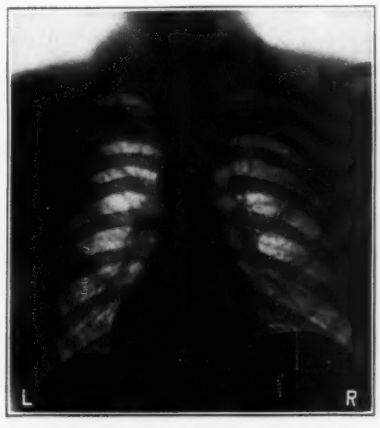

Fig. 2.—Same as figure 1, one month later, showing resolution of pneumonia with residual fibrosis and questionable increase in calcium deposit.

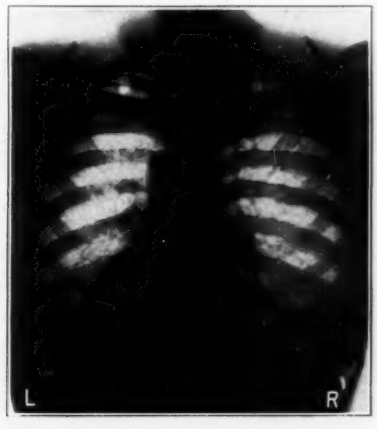

Fig. 3.—A case showing marked thickening of the trunk markings.

RESIDUAL CHANGES IN CHEST FOLLOWING TULAREMIA

Eight of the group in whom roentgen films were made during the active stage of the disease returned by request for further roentgenologic observation. Sixteen of the other patients in this series had their first films made at some time subsequent to three months after the infection. The twenty-four films in this recovered group have been reviewed and classified as follows: peribronchial thickening alone, nine; peribronchial thickening with apparently an excess of calcium, eleven; apparently an excess of calcium alone, four; mediastinal enlargement, cause undetermined, one, and within normal limits, two.

These roentgenologic interpretations might be subject to two criticisms: First, no comparison could be made with films taken before the tularemic infection; second, peribronchial thickening and calcium deposits are such common changes in supposedly normal chests that it is a matter of personal opinion as to what constitutes an abnormality. The first criticism could not be obviated in the cases available; the second criticism was recognized and led to conservatism in interpretations of the roentgenograms.

It has already been mentioned that roentgenographic peribronchial thickening may represent bronchitis, peribronchitis, fibrosis or a combination of the three factors. It was stated that the hazy appearance of the thickening present in the active cases was thought to be due primarily to bronchial and peribronchial inflammation. This hazy appearance was generally absent in the thickening seen in the patients who recovered, and this was interpreted to mean that fibrosis largely accounted for the changes observed. The thickening was generalized in some cases and localized in others. In a few instances the fibrosis occurred in areas known to have been involved at the time of acute infection. Most of the localized areas were not apical. In the cases in which apical thickening occurred, the possibility of a tuberculous etiology could not be ruled out. The incidence and amount of fibrosis in these tularemic patients indicated that tularemia was the probable cause of the lung changes, but other preexistent or coexistent causes of pulmonary fibrosis could not be absolutely excluded.

When no previous films are available for comparison, it is obviously difficult to estimate an increase in calcium deposits following tularemia. One cannot be certain that extensive calcification as a result of tuberculous infection might not have antedated the tularemic infection. In one of the present cases an excessive amount of calcium was observed in a film taken so soon after the tularemic infection that tularemia could not have accounted for the deposits. On the other hand, calcification in this series generally appeared to be greatly out of proportion to that seen in comparable groups without tularemia, and in one instance (case 30) it was thought that a definite increase in calcium deposit could be noted in films taken six weeks after recovery. There are so many points of similarity in the body reaction to tuberculosis and tularemia that it would not be surprising to find that tularemia also produced calci-

fication in the lungs. This study can offer no conclusive proof to this effect, but the data are sufficiently suggestive to indicate the need for further observations.

There was an enormous enlargement in the superior mediastinum in one patient (patient 6) whose films were made five years after the tularemic infection. The appearance of this lesion was consistent with a malignant condition or of pulmonary syphilis, but the patient seemed in unusually good condition and would not submit to further diagnostic studies. In view of the fact that another patient (patient 18) has recently had suppuration from a tularemic gland three years after infection, it may be that this mediastinal shadow represents persistent enlargement of tularemic glands and residual fibrosis.

The roentgen films of only two (patients 22 and 25) of the thirty-four patients were considered to be within the limits of normal.

SUMMARY

Definite pulmonary changes demonstrated by roentgen examination are present in a high percentage of cases of tularemia.

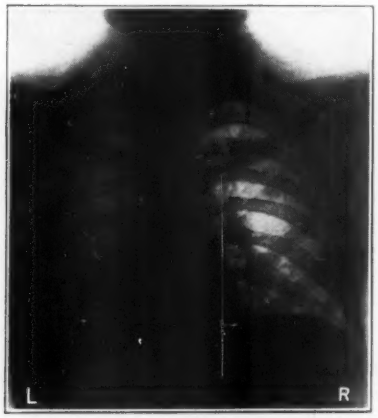

Fig. 4.—Massive pleural effusion resulting from tularemia.

Fig. 5.—Nodular infiltration in acute tularemia simulating the puerile type of tuberculosis.

The changes in the active cases are: (1) pneumonia, with or without necrosis; (2) pleural effusion; (3) nodular infiltration; (4) peribronchial thickening.

The residual changes are: (1) increased fibrosis; (2) an apparent increase in calcification.

Every atypical chest case occurring in tularemic territory should have the benefit of a diagnostic agglutination.

Distribution of Follicle Stimulating Factor and Luteinizing Principle.—These hormones are present in varying degrees of concentration in different parts of the body, and especially in the anterior part of the pituitary gland of all mammals and the placenta of human beings and some mammals. It is also found in the urine under certain conditions which include pregnancy, after the menopause, hydatiform mole, chorionepithelioma, some cancers, and the urine of men suffering from testicular teratomata. The injection of prolan into sexually immature animals is rapidly followed by signs of activity in the genital organs, which display ripening of the graafian follicles, follicular hemorrhages and luteinization in the ovaries, and hypertrophy in the walls of the uterus. All these changes are due to the action of this hormone upon the gonad, and not to any direct effect upon the uterus, because they do not occur in castrated animals; hence prolan is said to be gonadokinetic and not uterokinetic in function.—Robinson, A. L., and Datnow, M. M.: The Differential Diagnosis of Pregnancy, *Lancet* **1**:1 (Jan. 5) 1935.

INTERPRETATION OF ROENTGENOGRAMS IN PULMONARY TUBERCULOSIS

HENRY K. TAYLOR, M.D.
NEW YORK

Serial roentgen studies of pathologic changes of superinfections and reinfections (secondary) in pulmonary tuberculosis reveal that the lesions are either exudative or productive in character from the earliest time that patients come under observation. These lesions have a tendency to heal. The end result of the healing manifestations in pulmonary tuberculosis, demonstrable on the roentgen film, permits of a division into five types.

The exudative lesion terminates in one of three ways: (1) It may completely resolve and leave no traces in the roentgenogram, (2) it may resolve and leave a residual of a few fibrotic strands, or (3) it may undergo caseation and cavity formation. The productive lesions present themselves in one of two forms: (1) fibrotic strands with small nodules, and (2) fibrosis with numerous small cavitations resembling a bronchiectasis.

EXUDATIVE LESIONS

1. *Complete Resolution.*—Early in the development of this lesion there are coalescent multilobular areas of decreased aeration varying in size from a small patch to a lobe or lung, an area of exudation or consolidation, and with it perhaps a certain amount of atelectasis (fig. 1). This completely resolves in from six weeks to six months, leaving no traces of the lesion in the roentgenogram. During resolution, annular shadows sometimes appear, which may be confused with cavities. These annular shadows are not true cavities and disappear as resolution progresses. True cavities, which close spontaneously, usually leave some evidences (of fibrosis) in the roentgenogram.

2. *Resolution with Fibrosis.*—The roentgen changes are similar to the lesion described in the previous paragraph (fig. 2). Resolution takes place in from six to eighteen months, leaving a few fibrotic strands as a residue. Here also annular shadows resembling cavities may present themselves, disappearing as resolution progresses.

3. *Caseation and Cavity Formation.*—The lesion may be small or large. In the early stages it resembles the lesions just described. Nature's attempt at healing is to localize the lesion and expel the products of the infection. The result is caseation with cavity formation in a comparatively short time (fig. 3). Cavities serve as constant sources of tubercle bacilli. Superinfections to other portions of the lungs may occur. This caseating lesion may terminate in two ways: (1) It may completely excavate itself and leave one (fig. 4 *A*) or more cavities, or (2), after excavation, the involved lobe or lung may retract, causing deformities —deviation of the trachea, heart, mediastinum, retrac-

From the Department of Roentgenology, Sea View Hospital.
Read before the Section on Radiology at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 15, 1934.

tion of the chest wall and the like, all to the affected side (fig. 4 *B*). Pleural thickening also assists in producing deformities.

PRODUCTIVE LESIONS

1. *Fibrosis with Nodules.*—This type is not preceded by a demonstrable exudative lesion. On the roentgenogram are found small dense nodular shadows interspersed with fibrous strands (fig. 5 *A*). The lesion is very often bilateral. It may be limited to the apexes

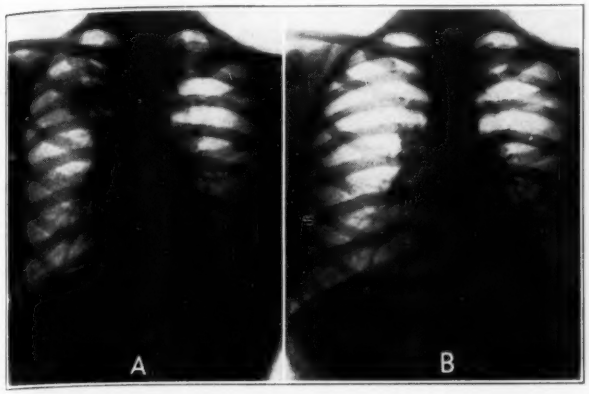

Fig. 1.—E. L., a white girl, aged 17 years: *A*, small coalescent exudative lesion in right infraclavicular area, Dec. 17, 1927; *B*, two months later, complete resolution with no trace in the roentgenogram, Feb. 14, 1928.

or upper lobes, remain stationary, or progress slowly and eventually result in extensive involvement of the lungs.

2. *Fibrosis with Small Cavitations.* — At times the nodular lesions in the previous type coalesce, caseate and produce small cavities (fig. 5 *B*). Following this, small miliary foci may develop adjacent to the lesion. A gradual extension of the lesion may occur by frequent bronchogenic spreads.

The types described here are not serial changes of one lesion. They all represent pulmonary tuberculosis. Clinically as well as roentgenologically, each type runs its own characteristic course, showing changes that are peculiar to it.

The exudative lesion that caseates and forms cavities shows many varieties: combinations of excavation, exudation, fibrosis, deformities and the like. These changes are incidental to this type and, because of these various stages of this one lesion, have fallen heir to many names, such as chronic ulcerative, fibrocaseous, ulcerocaseous and mixed cavernous lesions.

As mentioned in the beginning of this paper, the healing manifestations determine the type of lesion. Superinfections, in my experience, show no roentgen evidences of healing by calcification. If it does occur, it is exceedingly rare. The healing manifestation of the primary infection is resolution with a residue of one or more calcareous foci. The dissemination attending or immediately following the primary infection may heal by calcification.

Miliary tuberculosis is not included in the types described, for it is an accidental rupture of a caseating focus into the blood. This accident develops into a local or a generalized miliary tuberculosis. The liberation and wide dissemination of many organisms result in a generalized miliary tuberculosis with a fatal outcome in a comparatively short time (fig. 6 *A*). When few organisms are released from a caseating focus, they may develop miliary lesions wherever arrested. At times, a caseating focus may discharge at intervals. There are then crops of tubercles appearing with each discharge of organisms. In the lungs, the manifestations of an intermittent hematogenous spread show discrete and conglomerate tubercles of varying sizes (fig. 6 *B*). In the beginning, the area involved is not great, but with each succeeding discharge of organisms more and more lung structure becomes involved. In two patients I have seen such miliary lesions resolve, leaving no traces in the roentgenogram. A bronchogenic spread of the infection, either from a cavity or from a ruptured caseating tracheobronchial lymph node, sometimes resembles a miliary tuberculosis (fig. 6 *C*). Often it is an acinous spread of a benign nature, eventually disappearing.

From this brief description, it is apparent that the roentgenographic study of the pathologic changes in tuberculosis reveals a qualitative as well as a quantitative component. An evaluation of the quantitative component resulted in the National Tuberculosis Classification: minimal, moderate and extensive, modified by A, B, C and so on. An evaluation of the qualitative component demands some other designation to the lesion.[1] That this has occurred to others, the evaluation of the qualitative component is quite evident when one examines the literature.[2] Many classifications have been offered. Most classifications depend on autopsy material, without serial roentgenographic correlation. The autopsy material presents the terminal stage of the disease, giving no information as to progression or intermediate stages.

This presentation is a modification of the clinical classification of Ornstein, Ulmar and Dittler.[3] They used the terms benign-exudative, exudative-productive,

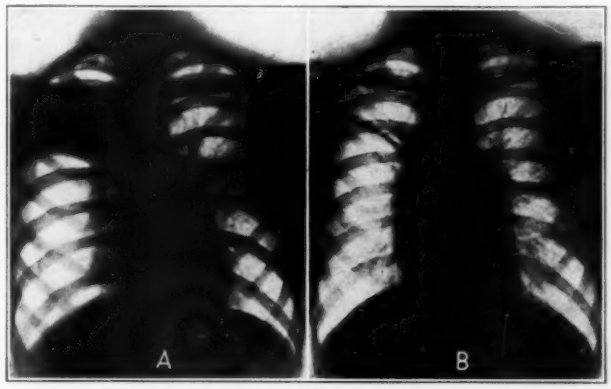

Fig. 2.—L. H. F., a Negro youth, aged 15 years: *A*, coalescent exudative lesions in right upper lobe and central portion of the left lung, Nov. 29, 1931; *B*, resolution of exudative lesions with residual of fibrotic strands, Jan. 16, 1934.

chronic-proliferative and caseous-pneumonic. While these terms are satisfactory, they are also confusing. They portray a pathologic state rather than a clinical impression. These authors are now dividing all their

1. In addition to the qualitative element of the lesion, the anatomic description as well as the quantitative component may be utilized. The lesions may be acinous, lobular, multilobular or lobar; discrete or coalescent; local or general; unilateral or bilateral; minimal, moderate or extensive.

2. Bendove, R. A.: Resolution and Healing in Pulmonary Tuberculosis, M. J. & Rec. **121**: 36 (Jan. 7) 1925. Krause, A.: The Healing and Disappearance of Tubercles, Am. Rev. Tuberc., May 1922; quoted by Bendove.

3. Ornstein, G. G.; Ulmar, David, and Dittler, E. L.: Benign Acute Pulmonary Tuberculosis, Am. Rev. Tuberc. **23**: 223-247 (March) 1931; A Clinical Classification of Pulmonary Tuberculosis, ibid. **23**: 248-285 (March) 1931.

cases into exudative and productive lesions.[4] The exudative lesions may (1) resolve quickly, (2) resolve slowly or (3) show no resolution. In 1931 Shipman [5] independently presented a clinical classification which closely resembled that of Ornstein, Ulmar and Dittler.

COMMENT

From a clinical standpoint, with the aid of the roentgen study, all cases of pulmonary tuberculosis can be divided into two groups: One group has practically

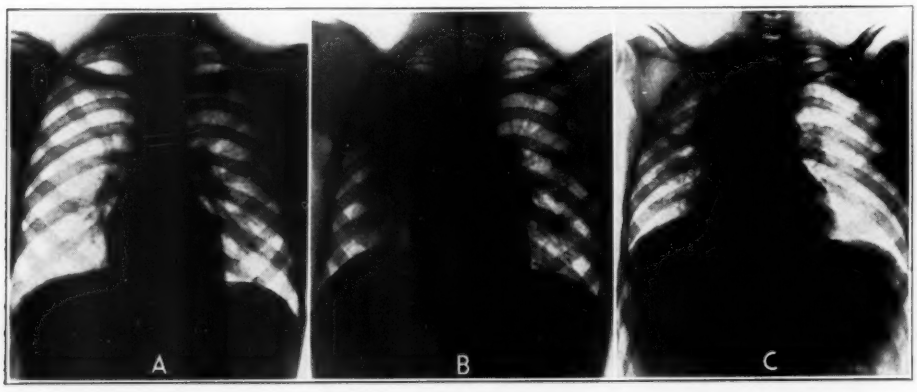

Fig. 3.—K. M., a Negro youth, aged 19, with tuberculous arthritis of the left elbow; *A*, routine examination of the chest showed no pulmonary tuberculosis, April 28, 1933; *B*, coalescent exudative lesion in the right upper lobe, December 8; *C*, four months later, the lesion is almost completely sloughed away, leaving a large cavity, April 13, 1934.

no mortality rate and can be considered benign; the other has a high mortality rate and should be considered malignant.

The benign lesions run mild clinical courses. Their prognosis is good and requires no active intervention, such as collapse therapy measures. The malignant lesions usually run a stormy course, often metastasize

Benign:

Exudative — complete resolution.
Exudative — resolution with residual fibrotic strands.

Productive — stationary.
Productive — slowly progressive.

Malignant:

Exudative—cavitation — without deformity.
Exudative—cavitation — with deformity.

Productive—coalescence of nodules with cavity formation.

and spread. These are the only types that compel the use of collapse therapy measures. The prognosis in the untreated case is bad.

The pathologic mutations observed in serial roentgenograms reveal whether a lesion is benign or malignant. This information aids in determining prognosis and treatment. A malignant lesion may be superimposed on a benign lesion by a reinfection or superinfection. In the productive lesions, when the nodules coalesce, caseate and produce cavities, the lesion should be considered malignant.

The foregoing graphic presentation of the various types of tuberculosis summarizes the correlation between the clinical and the roentgenologic changes.

333 West End Avenue.

4. Ornstein, G. G., and Ulmar, David: Personal communication to the author.

5. Shipman, S. J.: Clinical Classification of Pulmonary Tuberculosis, California & West. Med. **34**: 172 (March) 1931.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. ARCHER, BLACKFORD AND WISSLER AND DR. TAYLOR

DR. L. R. SANTE, St. Louis: It is hazardous to attempt the diagnosis of any radiologic study without full consideration of the clinical history. The paper of Drs. Archer, Blackford and Wissler brought out that there is a much more widespread involvement of the pulmonary tissues in tularemia than was formerly suspected. Their work seems to point out that the infection is primarily a septicemia which extends to the lung, at times producing lung destruction with pleural effusion, depending on the extent and severity of the infection. The residual fibrosis referred to in these cases is perhaps nothing more than one would expect when large areas of lung tissue were involved. In one instance in which bronchial development was found, the patient recovered and remained normal without evidence of residual fibrosis for two years but now I understand that he is again having lung trouble. The closest consideration should be given to the possibility of the healing of tularemic lesions by a calcium deposit. Up to the present it has been generally accepted that healing by calcification is considered evidence of a tuberculous cause of the primary infection; that is, that tuberculosis heals by calcification. I think therefore that one must be very careful in stating that tularemia also heals with calcification unless one has undisputable evidence. In Dr. Taylor's paper, the division into benign and malignant types of tuberculosis after following the cases through to the end result is a more or less simple matter and seems to me a very interesting study. When one attempts to apply it to new cases, however, in an endeavor to estimate the prognosis, that is another matter. I doubt whether it will be possible to predict what is going to happen in any case of pulmonary tuberculosis; there are too many complicating factors involved.

DR. KENNON DUNHAM, Cincinnati: This symposium in one way or another brings out the necessity for clinical consideration as well as roentgen study. The papers stress the necessity

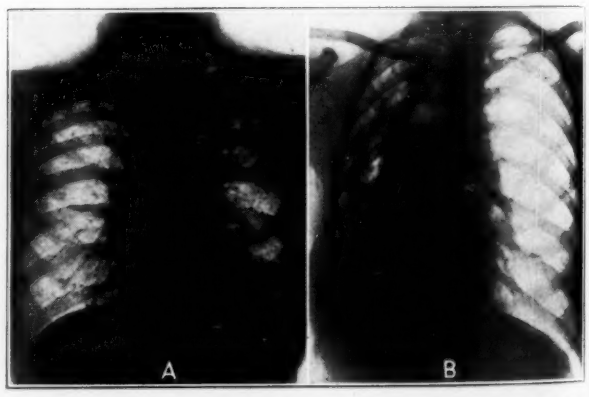

Fig. 4.—*A*, A. H., a white woman, aged 34: Lungs show cavities; no deformities; two year history. *B*, J. C., a white woman, aged 26: Retraction of right side of the chest and lung with deviation of trachea, heart and mediastinum to right; three year history.

for consultation. In other words, the radiologist should be a consultant and not a technician. Dr. Sante has stressed history taking and I wish to emphasize consultation. Few radiologists will make good physical examinations or take good histories, but they can learn much from men who do and they will teach those who do not. Our patients must be our first care. These papers show that consultation is necessary, because the clinical aspect must be considered and this will lead to further roentgen studies. Pulmonary tuberculosis is an infection and must be so

considered. The fan type is a lobular pneumonia. The bronchogenic spread produces bronchopneumonia, and the acute infection involving the greater part of a lobe is a lobular pneumonia. As in other pulmonary infection there are absorption and repair (scar tissue) and breaking down (abscess). I warn against a too fine classification, especially against diagnosing a benign type of pulmonary tuberculous inflammation. Some infections show much more virulence than others, but this is common to all inflammations. I urge caution. My experience does not justify cocksureness. I have seen very few cases of pulmonary exudate due to tuberculosis that were benign. They may clear

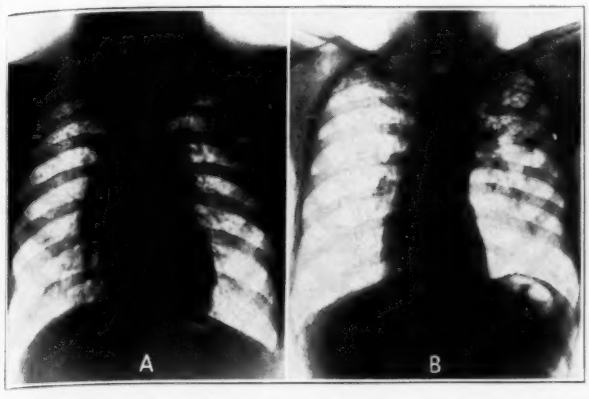

Fig. 5.—*A*, D. R., a white man, aged 24: Numerous small nodules in the upper lobes; eight year history. *B*, M. C., a Negro man, aged 37: Fibrosis with numerous small cavitations in the upper lobes; ten year history.

up for a time but they have a nasty way of returning. When such cases are noted, one should look for a focus of tuberculosis in some other part of the body such as surgical tuberculosis or a lymph node infection. These patients need great care after the lung has cleared. Humility and consultation are the watchwords in dealing with pulmonary inflammation. Physicians cannot know enough and therefore must tread lightly with all the knowledge at their command.

Dr. Eugene P. Pendergrass, Philadelphia: I think that in certain communities a routine agglutination test for tularemia in unexplained chest lesions is to be encouraged, and I feel quite sure that this accounts for the large number of cases that Drs. Archer, Blackford and Wissler reported. It has always seemed to me that a radiologist should approach a diagnostic problem by asking himself just what conditions could cause the appearance seen on the roentgenogram. The possibilities could be suggested to the clinician referring the patient, and further efforts made to differentiate the lesion by approved clinical methods. In the Archer, Blackford and Wissler report the cases of tularemia could simulate any one of several conditions such as lymphomas, tuberculosis of childhood or adult, influenza, Friedländer's pneumonia, mycotic infections, fusospirillary disease, sporotrichosis, spirochetosis, and possibly other things that I have not mentioned. The unusual feature of this infection is the possible deposition of calcium in a healing or healed lesion. There must be other infections besides tuberculosis that will cause calcification and healing, but it has been taught so long that calcification in a lesion usually means a healed or healing tuberculous process that it behooves one to be careful. Dr. Taylor's plan of grouping cases is of value for short time supervision, provided the patients are examined at regular intervals and the other indications (sedimentation test, white blood count, volume and quality of the sputum and temperature) are not disregarded. I have become impressed with the fact that grouping is all right for the immediate case but does not work satisfactorily when the study is carried over a period of years. Benign exudative lesions may interchange with benign productive lesions or benign productive (slowly progressive) with malignant exudative lesions with cavitation. As a rule, the true proliferative or productive lesion is seen in adults from 30 years up, and these lesions are liable to remain constant. Lesions in adolescence may do anything. They are very unstable, and I believe it is unsafe to group them as benign or malignant. I have had an opportunity to study the films of some of Dr. McPhedran's patients, and it is safe to predict that many radiologists would be surprised to see what a so-called benign lesion developed into. Because of these cases, I should hesitate to accept Dr. Taylor's ideas as to prognosis. Dr. Taylor refers to annular shadows. I would strongly recommend rotated films to determine whether an annular shadow is a cavity or not. There are many cases in which it is impossible to distinguish between annular shadows and cavities in good stereoscopic films. Cavities close to the hilus posteriorly are often missed in the postero-anterior view. Dr. Taylor states that superinfections do not heal by calcification. I should like to ask whether he means hematogenous or bronchogenic, exogenous or endogenous infections.

Dr. James L. Dubrow, Des Moines, Iowa: It is unsafe to diagnose pulmonary lesions as benign or malignant from the roentgenographic appearance alone. The basis for etiologic diagnosis is correlation of clinical with laboratory observations.

Dr. G. E. Pfahler, Philadelphia: The fact must not be lost sight of that tuberculosis and carcinoma can exist jointly in the same case, which means that the finding of tubercle bacilli doesn't rule out cancer. Likewise, to emphasize what has already been said here, one must not be satisfied always that a final diagnosis can be made at a single examination.

Dr. Hyman I. Spector, St. Louis: I just want to make one remark and that is that at times an attempt is made to differentiate an interlobar effusion from a malignant condition or a tumor. I remember two such cases in which the clinical signs and symptoms were those of a malignant growth but the x-ray shadow looked more like an effusion. At necropsy both effusions and malignant growths were found.

Dr. Henry K. Taylor, New York: I am not changing the concept of the pathology of pulmonary tuberculosis but presenting it from a slightly different point of view. I have deliberately omitted the clinical aspect from this paper and therefore shall not discuss the various clinical points raised. While I consider the roentgen examination only an aid to the clinician, the clinician will not and should not undertake to diagnose and treat without serial roentgen examinations of the chest. This presentation is based on serial examinations, clinical as well as roentgenologic. The conclusions drawn from this study are

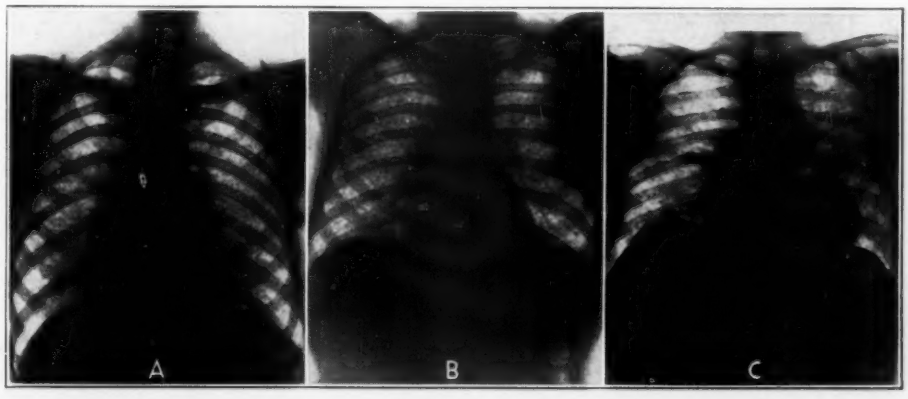

Fig. 6.—*A*, J. Z., a white man, aged 31, admitted May 26, 1932. One year before a tuberculous cervical gland was excised and drained for five months. In April he had complained of weakness, fever, cough, expectoration, anorexia and loss of weight. A roentgenogram, June 8, showed miliary tuberculosis. He died July 7. Autopsy showed generalized miliary tuberculosis. *B*, H. W., a Negro man, aged 24, admitted Nov. 17, 1933. A cervical gland had been excised three years before. Present illness started three months before admission with cough. Two months later, enlargement of the abdomen. A roentgenogram, November 20, showed few small acinous exudative lesions in the lower lobes. These lesions increased in size and number until the lungs were completely involved, December 26. He died Jan. 10, 1934. Autopsy showed miliary lesions in the lungs, peritoneum, spleen, adrenals, prostate and pancreas. *C*, T. De L., a white man, aged 39: Bronchogenic spread from cavity in the left apex.

summations at the end of the whole study. The problem now is to apply one's observations profitably while the patient is alive; and it can be done. At no time during the observation of a patient is a definite diagnosis made or prognosis given from the first or second examination, or from any single examination, unless it is recognized as a caseating lesion. I have seen many exudative lesions disappear without collapse therapy measures. If, in a benign exudative lesion, a pneumothorax should be induced or a phrenicectomy performed, either measure would receive credit for the cure of a lesion that would disappear with bed rest alone. Dr. Dunham mentioned that he does not see cases presenting benign lesions. The benign lesion is not new. The literature contains many case reports of benign lesions. The benign lesion probably occurs more often than one suspects but it is overlooked, for the clinical symptoms are mild, being no more severe than an ordinary cold, and roentgen examinations are not usually made. I have seen caseating lesions, collapsed early, not completely sloughed out, continue to caseate under pneumothorax. Dr. Pendergrass asserts that there is an interchange of lesions. Various types may appear in one individual; these are not serial changes of a lesion. Superinfections do vary. A so-called interchange of the lesion may be a spill. The course of a spill cannot be predicted at the onset. It may assume characteristics of any type described. I have not observed superinfections, adult type lesions, heal by calcification. Recently, Pinner stated that some hematogenous spreads heal by calcification. Several years ago, Miller commented on the difficulty of actually determining calcification in the roentgenogram. If any one can show me pulmonary roentgenograms devoid of calcareous deposits before a lesion appears, the same cases with subsequent tuberculous lesions, and calcareous deposits after the lesions heal, I will accept the statement that tuberculous lesions heal by calcification. Until then I will concede its possibility, and then only as a rarity.

DISLOCATIONS OF THE CERVICAL SPINE

SOME PREDISPOSING CAUSES

THEODORE PREWITT BROOKES, M.D.
ST. LOUIS

Reviewing a series of sixty-five of my own cases of traumatic dislocations of the neck, seen during the last six years, I am impressed with the presence of systemic predisposing causes in a certain small group. From a mechanical point of view, the more obvious offenders are stairways and automobiles, constituting twenty-one cases, or one third of the total. As a toxic predisposition, of course alcoholism heads the list, being definitely present in six cases and presumably responsible in several more.

Among destructive bone conditions, tuberculosis and osteo-arthritis of the cervical spine must be classified as direct causative factors and are not included in a study of traumatic dislocations. The possible existence of such lesions must be kept in mind. I have seen one dislocation of the cervical spine reduced, only to find by later developments that it was in reality an early case of cervical Pott's disease.

DISLOCATION DURING ILLNESS

Three cases developed in adults during treatment of other conditions. One was under the care of regular physicians, while the other two were seen by cultists. The former, case 17, showed severe rotary dislocation of the atlas after a siege of some weeks with peritonsillar abscess, tonsillectomy and adenitis. This was overlooked by several attending physicians in different communities, apparently by reason of infection in the neck. The lesion was eventually recognized and reduced some nine months after its occurrence.[1] It is a question whether or not this was one of the interesting group of nontraumatic dislocations described by Berkheiser and Seidler.[2] I am inclined to believe that it belongs to the group with weakened soft tissues, permitting dislocation with a minimum of violence. Such a case, occurring in the practice of Dr. F. H. Albee, was reported by Mixter and Osgood.[3]

MANIPULATIVE DISLOCATIONS

One of my own patients and one seen with Dr. F. A. Jostes suffered rotary dislocation of the atlas during treatment by cultists for painful muscles in the neck or chest. The former, case 40, presented a muscle strain and the latter, case 61, a myalgia of the neck with a "cold in the head." Each patient had received violent manipulation of the neck by cultists. Patient 40 suffered bilateral dislocation of the atlas, while patient 61 had marked rotation and unilateral dislocation of the atlas. The manipulators might maintain that the subluxation existed prior to the treatment and persisted by reason of the patient's failure to continue the "course of adjustments." However, such is not the history. The first patient received no definitive treatment of his dislocation for an entire year. The second man waited three weeks before consulting a competent physician. When he learned his ailment he refused for weeks to permit reduction, preferring to retain his displacement to use as an "exhibit" during legal proceedings against the cultist. A dozen such manipulative dislocations of the atlas came to light through the presentation of Blaine's paper before the American Medical Association in 1925.[4] On the other hand, one of our cases had been recognized by a cultist and referred to a competent surgeon after being inadequately handled by former medical attendants.

DISLOCATION DURING PRODROMES OF DISEASE

A more subtle preliminary to dislocation is seen in the prodromal stage of acute illness. This has proved confusing in five cases. A child does some awkward thing and then falls. Discomfort and complaint are no more than are to be expected from a fall. The next day the youngster is found to be suffering with an acute infectious disease and remains in bed. On recovery from the illness, a wryneck is noted and assumed to be toxic in origin. It is only after failure of expectant treatment that more careful examination reveals an actual dislocation of one of the vertebrae. The conclusion is forced on me that during the prodromal stage of an illness the youngster is more or less cranky and restless, probably even less sure footed than usual, and does some bizarre climbing or tumbling about that even his juvenile judgment would veto under normal circumstances. It is also probable that the tissues of the neck are less resistant to strains and pulls, permitting displacement with less than the usually required trauma.

From the Department of Surgery, Washington University School of Medicine.

Read before the Section on Orthopedic Surgery at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 14, 1934.

1. Brookes, T. P., and Ewerhardt, F. H.: On Reducing and Treating Cervical Dislocations, Arch. Phys. Therapy **13:** 463-467 (Aug.) 1932.
2. Berkheiser, E. J., and Seidler, Ferdinand: Nontraumatic Dislocations of the Atlanto-Axial Joint, J. A. M. A. **96:** 517-523 (Feb. 14) 1931.
3. Mixter, S. J., and Osgood, R. B.: Traumatic Lesions of the Atlas and Axis, Ann. Surg. **51:** 203, 1910.
4. Blaine, E. S.: Manipulative (Chiropractic) Dislocations of the Atlas, J. A. M. A. **85:** 1356-1359 (Oct. 31) 1925.

DIFFERENTIAL DIAGNOSIS

In earlier papers attention has been called to the frequency with which so-called simple rotary dislocations of the spine are overlooked. In injuries occurring during acute illnesses there is reason for attributing the condition to a toxic torticollis but no adequate excuse for faulty diagnosis. In toxic wryneck, the head is rotated and held down on one side by a spastic, shortened sternocleidomastoid muscle. Movement in any direction is painful, much more so than in dislocation, and constant. The deformity becomes corrected as the condition subsides. In rotary dislocation the head is twisted and held down by a bony block. The shortened sternocleidomastoid muscle on the down side of the head is soft and flaccid, while the corresponding muscle on the upward side of the rotated neck is taut and prominent. A certain amount of motion is easily made in the direction of displacement, while efforts to rotate the head in the direction of correction cause pain or are stopped by a sense of mechanical block at the site of dislocation. The deformity becomes more noticeable as atrophy of disuse develops in the tissues thrown out of commission on the down side of the neck.

ROENTGENOLOGIC AID

Roentgenograms, accurately taken and carefully interpreted, will verify the clinical observations in the majority of instances. Inability to demonstrate the dislocation in the roentgenograms should not, however, settle the diagnosis in the doctor's mind. Despite the remarkable development of technic and knowledge in the field of roentgenology, lesser dislocations or subluxations cannot always be shown conclusively on the films. This is especially true in the region of the atlas and axis. Routine roentgenograms call for three exposures: lateral of the cervical spine and two anteroposterior views, of which one is taken through the open mouth to show the first two vertebrae. Frequently, additional oblique views are required to show the articular processes.

In the latter cases of the series much help has been given by Dr. Sherwood Moore and his associates Dr. Hugh M. Wilson and Dr. T. S. Jung, operating the fluoroscopic unit in the Mallinckrodt Institute of Radiology. Incomplete reduction and even overcorrection have been demonstrated on occasions. It was then possible to replace accurately the dislocations while still under observation and apply the cuirass with the assurance that a second plaster would not be necessary as soon as films were made.

TECHNIC OF REDUCTION

Figures 6 and 7 show the adaptation of the Taylor[5] technic in this series. It has been used in the bilateral dislocations and in dislocations with known fracture complications. The Walton[6] technic has been used in the majority of unilateral simple dislocations. Some cases have required repeated use of both methods. In either technic the operator must be thoroughly familiar with the planned procedure for the particular case. Accurate diagnosis is the first requisite. He will then make a careful review of the articulated cervical spine as well as of the literature on the subject. A fair proportion of recent, uncomplicated cases may be reduced without anesthesia. I feel that cases of long standing, cases with fracture complications, and cases of severe extent can be better handled under general anesthesia. Redislocation occurs too often in cases in which temporizing methods have been used, with failure to secure full correction and accurate reseating of the articular processes. Such failure may also be due to delay in reduction, with development of changes in intervertebral joints or irreparable damage to the articular capsule. During the preparation of this paper patient 55 has returned, with redislocation six months after

Fig. 1 (case 58).—V. M. Extreme fracture dislocation without cord symptoms. Fracture extends through both laminae of the axis, permitting the body of this vertebra to be displaced downward in front of the body of the compressed third cervical. The posterior margin of the body of the second caught on the anterior margin of the crushed third, stopping further angling and fracture of the cord. The odontoid held to the ring of the atlas and the body of the axis as the latter broke away from the laminae, thus saving the cord from laceration.

Fig. 2 (case 58).—Roentgen appearance through plaster-of-paris cuirass after reduction. Normal cervical curve has been restored. Body and laminae of the axis are in approximation. Fragments of the third vertebra in satisfactory alinement. Two buckles appearing on the print are in the Sayre head sling, which was used during the Taylor technic of reduction. The head sling was also used to hold neck in hyperextension during application of the cast (fig. 7). It will not be removed until the cast is removed or changed.

Fig. 3 (case 58).—Appearance three months following reduction. Fracture through the laminae of the axis has healed completely. The ventral face of the third is in apposition with, and united to, the body of the vertebra. Compression of the body of the third is satisfactorily expanded and shows bone regeneration. There is slight tilting of the second, which cannot be improved.

5. Taylor, A. S.: Fracture-Dislocation of the Neck; A Method of Treatment, Arch. Neurol. & Psychiat. **12:** 625-639 (Dec.) 1924; Fracture-Dislocation of the Cervical Spine, Ann. Surg. **90:** 321-340 (Sept.) 1929.

6. Walton, G. L.: A New Method of Reducing Dislocation of Cervical Vertebrae, J. Nerv. & Ment. Dis. **20:** 609-611, 1893; Further Observations on Cervical Dislocation and Its Reduction, Boston M. & S. J. **149:** 445-447, 1903.

successful reduction. It is believed that the capsule or ligaments were torn severely. Open operation was resorted to, the method described by Mixter [3] as amplified by Jackson [7] being used. The surgical procedure was not to reduce the dislocation but to maintain the replacement. Reduction by the Taylor technic was first done, and a plaster cuirass was applied and bivalved. Three days later a heavy strand of braided silk was passed through the posterior ring of the atlas and tied to the spinous process of the axis. The success of the operation is not yet determined. I believe that it is applicable only to the atlanto-axial recurrent dislocations. The chances of successful reduction by open surgical approach are too doubtful to warrant their use except after all other means have failed and repeated displacements have recurred. The questionable value of open reduction in the neck has been well brought out by Taylor [5] and latterly by Towne.[8]

Fig. 4 (case 58).—Degree of hyperextension in plaster cuirass found necessary to maintain reduction in this particular instance, taken two months after injury. Patient comfortable and ambulatory.

Fig. 5 (case 58).—Celluloid "doll collar" applied after four months in plaster casts.

ILLUSTRATIVE CASES

CASE 2 (previously reported [9]).—E. W., a white man, aged 36, fell down some steps and was immediately brought to the City Hospital, unconscious. On regaining consciousness, he complained of pain in the neck. Roentgen examination showed anterior dislocation of the first cervical vertebra. He had an unexplained elevation of temperature for nearly three weeks, apparently due to a respiratory tract infection. This was one of the earlier cases in the series and was treated by head traction over the head of the bed without results. Reduction was done by the Walton [6] manipulation three weeks after injury. It is believed that the fall followed dizziness associated with the invasion by an acute infection of the respiratory tract. Owing to the delay, the reduction was not anatomically perfect, though clinically satisfactory.

CASE 9 (previously reported [9]).—R. W., a girl, aged 6 years, while playing at home one evening, fell over a chair, hurting her neck and leg. The next morning she had the mumps and spent two weeks in bed. On getting up she was found to have a wryneck. She was treated several weeks by several physicians, including myself, for toxic myositis. Additional roentgenograms compared with the original films led to the correct diagnosis of rotary dislocation of the third cervical vertebra. This was reduced four months after the injury.

CASE 39 (previously reported [10]).—A. R., a girl, aged 8 years, after a fall in the school yard, had a wryneck that disabled her. A short time later, "German measles" developed and she was taken to the Contagious Disease Hospital. There the correct diagnosis of traumatic dislocation was made, but for some reason she continued to be treated by a number of physicians and cultists for various alleged conditions. The history is confusing as to the exact length of time between the injury and the appearance of the rubella, but there is no question that the infection was credited by several persons with causing the wryneck. Severe rotary dislocation of the atlas was successfully reduced three months after injury.

CASE 43.—R. McG., a white boy, aged 4 years, placed a chair atop a small table and climbed into it. He fell to the floor. The neck was crooked, the condition becoming more noticeable forty-eight hours later, at which time a left submaxillary adenopathy developed. He was treated for septic adenitis for nearly three weeks. As the fever and inflamed glands subsided, Dr. Adrian Bleyer recognized the traumatic nature of the displacement and asked for orthopedic consultation.

Examination showed that the head was tilted to the left and that the chin was rotated to the right of the midline. The child could rotate the chin still farther to the right, but he came to an abrupt stop at the midline in an effort to rotate it to the left. Films taken at the Mallinckrodt Institute of Radiology by Dr. Sherwood Moore showed anterior luxation and rotation of the second cervical vertebra (fig. 8). Four weeks after injury, the dislocation was

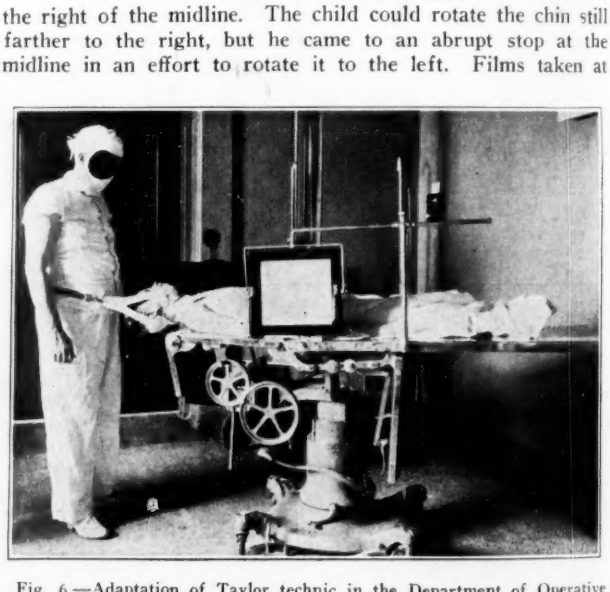

Fig. 6.—Adaptation of Taylor technic in the Department of Operative Fluoroscopy of the Mallinckrodt Institute of Radiology, Washington University School of Medicine. Any stationary table is used. Countertraction is secured by crossed shoulder straps of muslin. Ends of these may be held by assistants or fastened to the table. Traction is applied with a Sayre head sling attached to a belt about the operator's waist. His hands are free to manipulate the head and neck. The roentgenologic unit is set up behind the table. A fluoroscopic screen is ready to be moved into position.

7. Jackson, R. H.: Simple Uncomplicated Rotary Dislocation of the Atlas, Surg., Gynec. & Obst. **45**: 156-164 (Aug.) 1927.

8. Towne, E. B.: Injuries of the Spinal Cord and Its Roots Following Dislocation of the Cervical Spine, Surg., Gynec. & Obst. **57**: 783-787 (Dec.) 1933.

9. Brookes, T. P.: Dislocation of the Cervical Spine, J. Missouri M. A. **27**: 177-180 (April), 579-582 (Dec.) 1930.

10. Brookes, T. P.: Dislocations of the Cervical Spine; Their Complications and Treatment, Surg., Gynec. & Obst. **57**: 772-782 (Dec.) 1933.

reduced under nitrous oxide-oxygen anesthesia at the St. Louis Children's Hospital, the Walton technic being used. A plaster-of-paris cuirass was applied. Reduction was verified by roentgen examination. The cast was worn for three weeks, after which a Thomas collar was worn for two months. Routine physical therapy was employed during this time. Complete recovery occurred, with full use of the neck.

Fig. 7.—After fluoroscopic verification of reduction, the patient and the underlying steel strip are pushed off the table as far as the patient's waist. Cephalad end of steel strip is supported on a length of gas pipe set in a floor flange. When forceful hyperextension is indicated, traction is maintained during application of plaster. The shoulder straps have been cut away in the illustration and the patient is being steadied by traction on the wrists. The head sling may remain until the cast is removed, or special clips may be used to permit unlocking and removal of the sling after the cast has set.

CASE 53.—B. O'B., a Negro man, aged 54, seen Aug. 17, 1933, at City Hospital No. 2, through the courtesy of Dr. Franklin Walton and Dr. H. E. Hampton, had two days previously been seated in an open window. He became suddenly dizzy and pitched out of the window, landing on his head some 15 feet below. He complained of pain in the back of his neck. Motion of the neck was possible through a limited arc. No gross neurologic changes were noted. Roentgenograms by Dr. E. W. Spinzig showed an interesting and unusual double dislocation of the cervical spine (fig. 9). The first five vertebrae were displaced forward on the sixth until the articular processes of the fifth were caught in the intervertebral notch anterior to the articular facets of the sixth and rested on the pedicles of the sixth. A second dislocation existed between the seventh cervical and the first thoracic vertebrae, the sixth and seventh being displaced anteriorly for a distance of one fourth of the depth of the vertebral body. August 18, under ether anesthesia, the Taylor technic secured complete reduction, verified by roentgenograms. The patient remained unconscious, however, after the anesthetic. Reflexes were completely abolished and the patient died forty-eight hours later. Autopsy by Dr. D. L. Harris revealed marked arteriosclerosis of the brain, with softening of the left lateral lobe above the occipital area due to thrombosis of the posterior branch of the middle cerebral artery. An area of softening a week old was present. Evidently the first symptom of thrombosis was dizziness, resulting in the fall and dislocation of the neck. The area of softening was in a "silent" area of the brain and gave no gross neurologic signs at first but later caused death.

CASE 58.—V. M., a white girl, aged 16 years, was pitched out on her head during a collision between two automobiles. The case is reported and figures 1 to 5 are shown to illustrate the consecutive steps in the care of a severe injury of this character. At the City Hospital she was found to have fracture dislocation of the first, second and third cervical vertebrae, fracture of the superior maxilla, and Colles' fracture of the left wrist. Thirty-six hours after injury, fracture dislocation of the neck was reduced by the Taylor technic and a plaster cuirass applied. Roentgenograms by Dr. LeRoy Sante showed the position to be fair but not perfect. Manipulation under anesthesia was again done a week later. This time roentgenograms showed good replacement. A close check up was necessary, as the tendency was for the second vertebra to slip down in front of the compressed and deformed third. Full hyperextension in the cuirass was maintained for sixteen weeks. A celluloid "doll collar" was then applied, to be worn during the remainder of the year following the injury. The patient has good range of motion and roentgenograms show firm union with good position.

Classification of Sixty-Five Dislocations

Location of Dislocation	
First cervical vertebra	27
Second cervical vertebra	17
Third cervical vertebra	4
Fourth cervical vertebra	7
Fifth cervical vertebra	9
Sixth cervical vertebra	1
Seventh, with fifth cervical vertebra	(1)
	65
Nature of Dislocation	
Unilateral	47
Bilateral	18
	65
Results	
Attempted reduction	60
Complete reduction	47
Partial reduction	14
Failure of reduction	1
Deaths from reduction	0
Deaths from injury	5
Redislocations requiring repetition of reduction	0

CONCLUSIONS

Stairways, automobiles and alcoholism are obvious predisposing causes of traumatic dislocations of the neck. In adults, an approaching illness may precipitate a fall and dislocation. In children, restlessness and irritability are frequently unrecognized prodromes of an acute infectious disease. A fall during such a prodromal stage may more easily produce dislocation of the upper cervical vertebrae by reason of the impairment of ligaments and other restraining tissues. Development of the impending infectious disease confuses the clinical picture and has led in a number of cases to the erroneous diagnosis of toxic torticollis.

Fig. 8 (case 43).—R. McG., a boy with toxic adenitis. Forward slipping of the body of the second cervical vertebra. Rotation and tilting of the first and second vertebrae are evident from the obliquity of the posterior rings.

Fig. 9 (case 53).—B. O'B., an adult with thrombosis of the middle cerebral artery. Double dislocation. There is clearly shown a bilateral dislocation of the fifth. The inferior articular processes are caught in front of the superior articular processes of the underlying sixth. In addition there is definite, though less marked, anterior dislocation of the seventh cervical on the first thoracic vertebra.

ABSTRACT OF DISCUSSION

DR. R. D. SCHROCK, Omaha: I should like to add another of the causes. I have in mind the anesthetist who is careless in leaving his patient to be transferred from the operating table to the stretcher by some one who is not quite aware of the danger of rapidly slipping off the child, or even an adult, to the waiting cart, without careful protection of the relaxed neck. Emphasis should be given the accurate reduction as indicated by careful, readable roentgenograms and the very sharp hyperextension of the neck to maintain over a period of time sufficient to permit not only firm soft parts healing but firm bony formation, so making the damaged cervical region stable to withstand the minor falls that children particularly are subjected to and the consequent danger of the very serious accident that may result from what would be relatively minor falls.

DR. CARL B. DAVIS, Chicago: Dr. Brookes's paper covers the field of dislocations of the cervical spine, with predisposing causes, in a manner that surpasses anything I have seen. Most physicians are familiar with the group that are produced by trauma. The nontraumatic group described by Berkhesier and Seidler, in addition to Dr. Brookes's cases, is an interesting division. A valuable aid in the reduction of these cases is that offered by an anatomic specimen consisting of a cervical vertebra articulating in normal relationship. Before treating the patient, Dr. Brookes is in the habit of reproducing the deformity on the anatomic specimen. In this manner he obtains a very clear idea of the various steps to be used in the reduction. I feel sure that if I had made use of this anatomic specimen in some of my own cases I would have achieved better results. I suggest to those who are interested in the subject that it will be well worth the trip to St. Louis to see Dr. Brookes handle some of these injuries.

PEPTIC ESOPHAGITIS

A NEW CLINICAL ENTITY

ASHER WINKELSTEIN, M.D.
NEW YORK

The causes of esophagitis are usually given as follows:

1. Irritative (mechanical, thermal and chemical irritants, including alcohol and tobacco).
2. Specific (syphilis, tuberculosis, actinomycosis).
3. Secondary as a complication of (*a*) cardiospasm, (*b*) diverticula or (*c*) neoplasms.

Recently I have observed some patients with a type of esophagitis that does not seem to fit into this classification. The features of these cases are so distinctive as to impress one with the probability that they form a separate clinical entity. They are, therefore, presented for consideration.

REPORT OF CASES

CASE 1.—S. P., a man, aged 77, for three years had complained of typical symptoms of duodenal ulcer; viz., late hunger pains, some nausea and sour vomiting. He presented a deformed duodenal bulb radiographically. This attack was relieved by a Sippy regimen. Three months later the symptoms of duodenal ulcer returned. In addition he complained of dysphagia with lower substernal pain after meals. A large stomach tube met an obstruction at the lower end of the esophagus. An esophageal neoplasm was suspected. Radiography revealed a markedly irregular narrowing of the lower third of the esophagus without any dilatation above (fig. 1). Esophagoscopy by Dr. Rudolph Kramer showed inflammation of the lower 3 inches of the esophagus. A biopsy was performed and the tissue showed "acute and chronic inflammation." The patient was treated with olive oil before meals, an ulcer diet, alkalis and atropine. After one month he lost his symptoms and remained well for six months. The symptoms both of the ulcer and of the esophagitis then returned. He also complained of "heartburn" and constant burning pain under the lower part of the sternum. Again his symptoms disappeared on ulcer therapy. The roentgenogram of the esophagus then became normal but the irregular duodenal bulb persisted. He has now been well for fourteen months. Fractional test meals taken during the attacks showed marked hyperchlorhydria.

CASE 2.—W. R., a man, aged 56, suffered from an acute perforation of a duodenal ulcer after seven years of peptic ulcer symptoms; viz., pain and heartburn three hours after meals, relieved by food and alkalis. Following the gastrorrhaphy operation, marked esophageal symptoms set in. He complained of dysphagia, inability to swallow solids, and pain under the lower part of the sternum. After several weeks of these symptoms he was examined at the clinic. A large stomach tube met an obstruction at 14 inches. Radiography showed an irregular narrowing and spasm of the lower part of the esophagus without dilatation (fig. 2). Esophagoscopy showed a swollen and inflamed mucosa at 35 cm. A biopsy specimen revealed "acute and chronic inflammation." The symptoms of ulcer were also present and so severe that three months after the perforation a partial gastrectomy was done by Dr. A. A. Berg. The resected antrum and duodenum in addition to the ulcer was also the site of a severe gastritis and duodenitis. After this operation the esophageal symptoms grew steadily worse. The large stomach tube met an obstruction at 14 inches. Radiography revealed spasm and irregular narrowing of the lower third of the esophagus. Esophagoscopy showed narrowing, intense congestion, and a granular appearance of the mucosa, 34 cm. from the mouth. The biopsy specimen was reported "acute purulent inflammation" (fig. 3). He was treated in the hospital with a special therapy for peptic ulcer; viz., a continuous alkalinized intragastric milk drip through the Rehfuss tube.[1] His symptoms improved rapidly and he gained weight. He was seen again several months later with another attack of mild esophageal symptoms. The curve of gastric acidity before the partial gastrectomy was quite high (free hydrochloric acid between 80 and 90) and moderate after the operation (from 30 to 40).

CASE 3.—L. A., a man, aged 57, because of dysphagia, obstruction at the cardia by stomach tube, radiography, and loss of weight, was told five years before admission to the hospital that he had carcinoma of the esophagus. He complained of dysphagia, lower substernal pain radiating through to the back, heartburn, inability to swallow solids, and sour regurgitation. The course of his illness was a chronic one with exacerbations and remissions for five years. Esophagoscopy by the late Dr. Sydney Yankauer revealed a small punched-out ulcer 1.5 cm. above the cardia. Radiography showed irregular spasm of the lower part of the esophagus (fig. 4). The biopsy specimen was reported "acute and chronic epithelial and subepithelial inflammation." A fractional test meal showed a marked hyperchlorhydria (100 free acidity). With antacids and a bland diet he lost his symptoms. In the last two and a half years he has had three similar attacks. In the last attack radiography showed a circular constriction at the lower third of the esophagus. Esophagoscopy then revealed evidence of inflammation without ulceration and a biopsy specimen was reported "acute and chronic inflammation." Between the attacks his general health has been excellent.

CASE 4.—S. W., a man, aged 61, complained of epigastric pain two hours after meals, relieved by food and alkalis, and that his food would "stick" under the lower part of the sternum. Because of this symptom, his age, and a loss of weight in six weeks of 12 pounds (5.4 Kg.), a carcinoma was suspected. The large stomach tube met an obstruction at 17 inches. A test meal showed marked hyperchlorhydria (90 free acidity). Radiography revealed an irregular narrowing of the lower part of the esophagus and also some irregularity on the adjacent lesser curvature (fig. 5). Esophagoscopy revealed an inflamed mucosa and the biopsy specimen was reported "acute

From the Medical Department, Mount Sinai Hospital.
Read before the Section on Gastro-Enterology and Proctology at the Eighty-Fifth Annual Session of the American Medical Association, Cleveland, June 13, 1934.

1. Winkelstein, Asher: Am. J. M. Sc. **185**: 695 (May) 1933.

and chronic inflammation." His symptoms disappeared on ulcer therapy. Four months later there was a recurrence of the dysphagia for a few weeks. He now has ulcer symptoms, and radiography reveals an ulcer of the lesser curvature immediately above the incisura angularis.

CASE 5.—M. L., a man, aged 55, for four years had attacks of epigastric pain two hours after meals, with heartburn and sour belching. He also had mild dysphagia. A fractional test meal showed hyperchlorhydria (64 free acidity). A partial

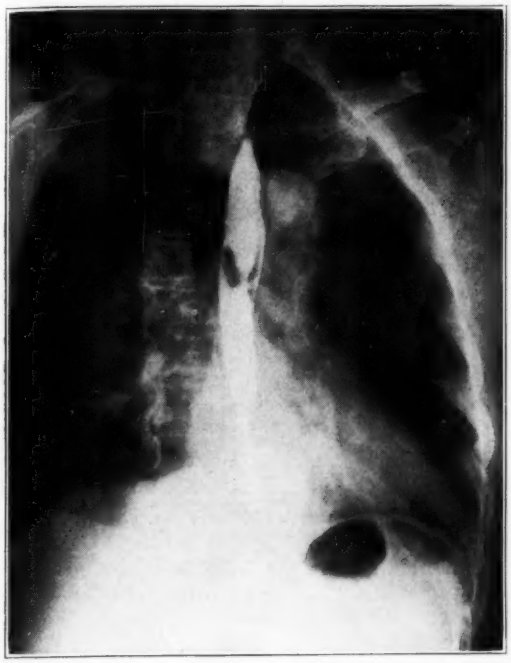

Fig. 1 (case 1).—Irregular narrowing of lower third of esophagus without dilatation above.

gastrectomy for multiple duodenal ulcers was performed by Dr. A. A. Berg. Following the operation he complained of severe dysphagia, lower substernal pain and sticking of solids at the lower part of the esophagus. Radiography revealed narrowing and irregularity of the lower part of the esophagus (fig. 6). The large stomach tube could not be passed beyond 14 inches. Esophagoscopy showed inflammation of the mucosa, and the biopsy specimen was reported "acute and chronic inflammation." A fractional test meal resulted in a high acid curve (60 free acidity). He was relieved after one month of ulcer therapy. Two months later the same symptoms recurred and roentgenograms revealed marked constriction of the lower third of the esophagus. This time the biopsy specimen was reported "acute purulent inflammation." After two months he again lost his symptoms and has remained well for fifteen months.

COMMENT

Certain features are prominent in this group. The patients were all elderly men in whom, because of certain esophageal symptoms, carcinoma was suspected. While the symptoms did suggest the diagnosis of carcinoma, the prolonged course of the disease and the results of biopsy were sufficient to exclude that diagnosis.

It is apparently a chronic disease, characterized by exacerbations and remissions resembling those of peptic ulcer. The association with duodenal ulcer in three cases, and with a preexisting peptic ulcer of the esophagus in case 3, and the subsequent lesser curvature ulcer in another case is striking. The type of substernal pain, heartburn, sour regurgitations and the hyperchlorhydria in all recall the clinical features of peptic ulcer of the esophagus which have been described in this country by Jackson [2] and Friedenwald.[3] Indeed, the localization is identical and the radiographic observations of an irregular spasm of the lower part of the esophagus without dilatation above are common to the two. However, the esophagoscopy in the cases described here reveals a diffuse inflammation without a definite ulcer. The biopsy reports were variously "acute and chronic inflammation" and "acute and chronic purulent inflammation." Ectopic islets of gastric glands were not encountered. Finally the relief obtained by antacid and ulcer therapy is quite definite and impressive. It is easy to exclude other esophageal diseases. Traumas and excessive irritation are conspicuously absent in the history and there was also no suspicion of syphilis. The features here are obviously not those of so-called cardiospasm, in which the characteristic roentgenogram with a diffuse dilatation with a smooth lower end of the esophagus is always present.

As a result of these observations, one cannot avoid the suspicion that the disease in these five cases is possibly a "peptic" esophagitis; i. e., an esophagitis resulting from the irritant action on the mucosa of free hydrochloric acid and pepsin. The mechanism is not entirely clear. The frequent, almost constant presence of duodenitis and antrum gastritis in peptic ulcer has been well known since the studies of Konjetzny and Puhl in Germany and Aschner in this country. This "peptic" esophagitis may be analogous to such states. The eroding gastric juice, rising into the lower part of the esophagus and held there by a mild spasm of the cardia, may injure a mucosa made susceptible by age and the "ulcer constitution." Secondary infection

Fig. 2 (case 2).—Irregular narrowing and spasm of lower part of esophagus without dilatation.

may readily explain the more or less purulent nature of the inflammation. Mild spasms of the cardia and lower esophagus are not uncommonly seen radiographically in peptic ulcer of the stomach and duodenum.

2. Jackson, Chevalier: Peptic Ulcer of the Esophagus, J. A. M. A. **92**: 369 (Feb. 2) 1929.
3. Friedenwald, Julius; Feldman, M., and Zinn, W. P.: Tr. Am. Gastro-Enterol. A. **31**: 93, 1929.

A review of the literature on diseases of the esophagus has failed as yet to reveal any definite reference to the disease picture herein described. However, the possibility of other agencies should not be overlooked entirely. As emphasized in my paper on cardiospasm,[4] psychic factors play an important rôle in the production of esophageal symptoms. It may be that in the cases with actual ulcer the psychic reaction of the individual to his disease induces esophageal or cardial spasm with a secondary infectious inflammation totally unrelated to an acid or peptic factor. A simple reflex mechanism might possibly do the same.

It is interesting to speculate, with these cases in mind, on the symptom of heartburn. This has been explained as due to the action of acid gastric contents on a hyperirritable esophageal mucosa. It seems important, particularly in the severe instances and especially when heartburn is the only symptom of ulcer, to examine the lower part of the esophagus by radiography and esophagoscopy for esophagitis. Recently I encountered the following case:

A man, aged 55, had suffered for seven and a half years with severe heartburn after meals. Radiography of the stomach and duodenum was negative. Esophagoscopy by Dr. Kramer revealed a swollen mucosa at 34 cm. A biopsy specimen was reported "subacute and chronic esophagitis." He had a moderate hyperchlorhydria.

SUMMARY AND CONCLUSIONS

1. A group of patients had unusual and distinctive esophageal symptoms.

2. The course, location, radiologic examination and pathologic features, the association with peptic ulcer and hyperchlorhydria, and relief by ulcer therapy, suggest that the disease is a "peptic" esophagitis.

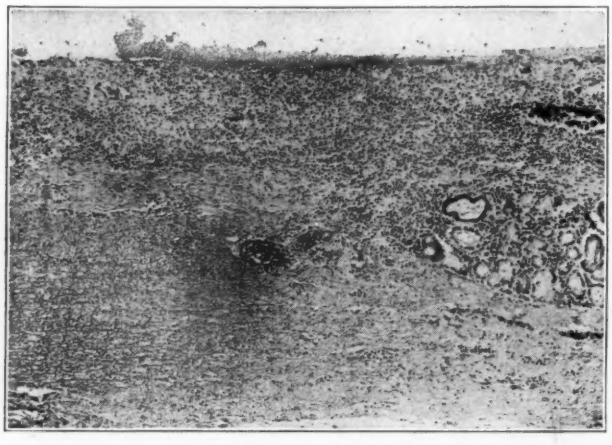

Fig. 3 (case 2).—Section of biopsy specimen showing epithelial erosion, with polynuclear infiltration of the mucosa, submucosa and muscularis.

3. Heartburn may be due to "peptic" esophagitis.

4. This disease is important in differential diagnosis especially from carcinoma of the esophagus.

1185 Park Avenue.

ABSTRACT OF DISCUSSION

DR. CHEVALIER JACKSON, Philadelphia: I am in hearty accord with the writer of this paper. Chronic esophagitis is a common disease due to a variety of causes not all of which are known or, at least, proved. My experience coincides with that of the author that the cause of this kind of esophagitis is similar to the causes of gastric ulcer; but here controversy is encountered. If we were to start the discussion now on the causes of gastric and duodenal ulcer, we wouldn't get through today except with the chairman's help. Nevertheless, I think that the word "peptic" is justified by the fact that all of these ulcers in the esophagus, the stomach and the duodenum are within the area of the gastric juice, and for parallel reasons this form of esophagitis, which is also within the area flooded intermittently by the gastric juice, I think is quite properly called "peptic." Whether the juice is the primary or perpetuating factor is a matter for discussion. This form of inflammation is often seen at the lower end of the esophagus in cases of herniated stomach, a condition that has become more and more a matter of great diagnostic importance in a patient presenting himself with gastric symptoms. The chief reason, I think, why so little has been heard of peptic esophagitis is that so few esophagoscopies are done in patients with gastric symptoms. I should like to add a point that I think is borne out by every one of the cases presented by the author; namely, that in every patient with unyielding gastric symptoms esophagoscopy is indicated. It is well known that the roentgen ray is one of the most important of all diagnostic means. But additional information is obtainable with the esophagoscope.

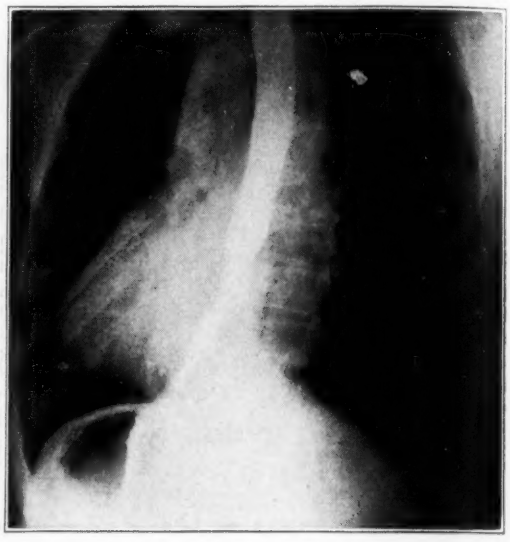

Fig. 4 (case 3).—Irregular spasm of lower part of esophagus.

DR. RUDOLPH KRAMER, New York: Dr. Winkelstein has made a contribution to knowledge of diseases of the esophagus in separating this group of cases from the conglomerate mass of heterogeneous conditions involving the lower end of the esophagus. It is an interesting coincidence that two days ago at the American Bronchoscopic Society Drs. Moersch and Camp reported a series of cases identical with those of Dr. Winkelstein. I think Dr. Winkelstein's hypothesis as to peptic esophagitis and its etiology is most reasonable. There are two conditions, both dependent on the time element, which appear to be of great importance. In the first, one is confronted by a patient, in the middle or later years of life, with heartburn, dysphagia, substernal pain, loss of weight, and irregular constriction of the lower esophagus on roentgen examination; and these symptoms have been present for a short period of time. The picture is that of a carcinoma of the esophagus, and that is what both the patient and the physician fear is present. In the second situation the patient has had the foregoing symptoms for a long period, perhaps several years. Carcinoma, although still a possibility, is hardly likely to be the cause of the condition. One would consider peptic ulcer of the esophagus or cardiospasm. In either situation, recourse must be had to esophagoscopy for a definite diagnosis. The appearances on esophagoscopy are an edematous or a reddened, thickened mucosa, which may at times be granular. This involves usually the lower half or third of the esophagus, but occasionally it may spread upward to involve the rest of it to a lesser degree. In addition there may be an exudate in small patches or in large plaques. There is a marked narrowing

4. Winkelstein, Asher: Am. J. Surg. **12**: 135-138 (April) 1931.

of the lumen, which can, however, be completely traversed by the esophagoscope and the cardia entered without difficulty. In following out the principle of always doing a biopsy on tissue that has the slightest appearance of abnormality, I have found chronic inflammation of the mucosa and submucosa in all these cases, and acute purulent inflammation often associated with this. There may be variations in the degree of infection in the same case at different periods. This has been noted both on esophagoscopy and on histologic examination of the excised tissues. It is important to rule out carcinoma as soon as possible, and, further, to institute appropriate therapy as established by Dr. Winkelstein so as to prevent the physical and mental deterioration of these patients.

Dr. Henry A. Rafsky, New York: To detect the lesions of the lower third of the esophagus, I wish to call attention to two simple and yet valuable aids. The first is the timing of the swallowing sounds. Normally they should be heard at the cardia from seven to ten seconds after the ingestion of fluids. A persistent delay or absence of the swallowing sounds may be the first indication of the presence of a carcinoma of the lower end of the esophagus. The return of the swallowing sounds is also of prognostic value. An original diagnosis of carcinoma of the esophagus may have to be revised if the sounds return. This was recently demonstrated in a patient at the Lenox Hill Hospital, who had a herniated stomach. The string test is also of value in detecting an erosion or a small ulceration of the lower end of the esophagus, notwithstanding the fact that other methods fail to reveal the lesion. The presence on the string of two small blood stains, probably no larger than the head of a pin, with a clear area of space in between, is pathognomonic of an ulcer or erosion. I recently saw two patients with a syndrome similar to that described by Dr. Winkelstein; one was 67 years of age and the other was 70. The patients had in addition periodic manifestations of cerebral arteriosclerosis, and it was interesting—I don't know whether it was a coincidence or not—that when they had a remission in the cerebral symptoms the gastric symptoms likewise cleared up. The pain and heartburn disappeared and the patients

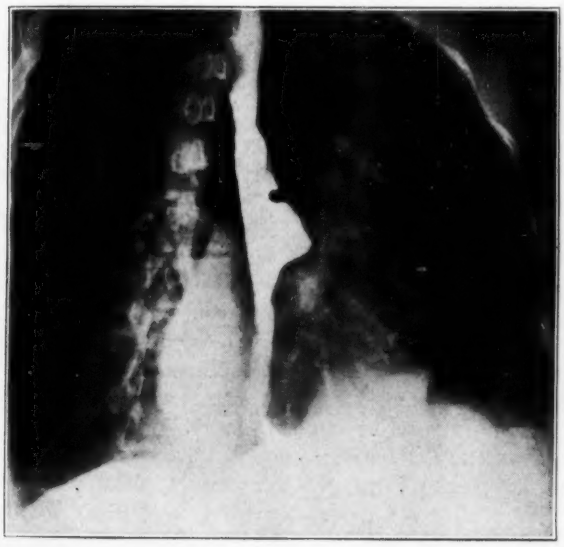

Fig. 5 (case 4).—Irregular narrowing of lower part of esophagus and some irregularity on adjacent lesser curvature.

gained in weight and there was a return of the swallowing sounds. There was a persistent hyperchlorhydria in one patient and persistent achlorhydria in the other.

Dr. H. J. Moersch, Rochester, Minn.: I wish to corroborate the excellent presentation of Dr. Winkelstein. As Dr. Kramer has stated, two days ago, before the American Bronchoscopic Society, I, in conjunction with Dr. Camp of the Mayo Clinic, reported a series of cases which, I believe, had features identical with those of the group of cases reported by Dr. Winkelstein. However, the paper prepared by Camp and me bore the title "Diffuse Spasm of the Lower Third of the Esophagus" rather than "Peptic Esophagitis." Pain and dysphagia are the outstanding symptoms. The pain of two of our patients reached such intensity that a previous diagnosis of angina pectoris had been made, and it was only after electrocardiographic studies and the subsequent course of events that we were able to demonstrate that the pain was definitely related to diffuse spasm of the esophagus. As pointed out by the

Fig. 6 (case 5).—Narrowing and irregularity of lower part of esophagus.

author, we believe the condition is associated with intra-abdominal disease. Three of our patients were operated on for intra-abdominal disease, and with removal of the intra-abdominal condition the esophageal symptoms completely subsided. All our patients were between 50 and 70 years of age and were equally divided as to sex.

Dr. Asher Winkelstein, New York: It is gratifying to hear that a man with Dr. Chevalier Jackson's experience in esophagoscopy has seen this type of esophagitis with some frequency. My experience has been limited to eight cases. This is possibly due to the fact that I have studied only cases presenting severe esophageal symptoms. Dr. Rudolph Kramer, the esophagoscopist at Mount Sinai Hospital, deserves credit for careful and repeated studies of these cases. I still have this group of patients under observation and will carry out Dr. Rafsky's suggestions. It is always interesting to hear of the coincidence of scientific observations. The cases mentioned by Dr. Moersch are apparently the same as I have described.

Epidemic of the Sweat.—The fifth and last epidemic of the sweat occurred in 1551. Again it started in England, this time in Shrewsbury, in April, where 900 died in a few days. . . . Only once after this date (we take our information from Senf) has a sickness resembling the English sweat occurred, unless we identify the disease—as many have done—with the Picardy Sweat. About two hundred and fifty years after the fifth epidemic, that is, in 1802, at Rottingen in Franconia, a similar but regionally limited malady appeared. It is impossible to identify the sweating sickness with any epidemic disease now prevalent. Purely on the basis of synchronous occurrence, Schnurrer and others believe that it was a modified form of typhus, and it is true—as Senf points out—that it did not spread into any of the countries where typhus was prevalent at the time. However, this opinion is not convincing. The sickness remains an entirely individual condition which could not—were it to reappear at present—be properly classified with any of the known infectious diseases.—Zinsser, Hans: Rats, Lice and History, Boston, Little, Brown & Co., 1935.

A COMPARISON OF THREE ELECTRICAL METHODS OF PRODUCING ARTIFICIAL HYPERTHERMIA

FRANCIS W. BISHOP
EMMY LEHMAN, R.N.
AND
STAFFORD L. WARREN, M.D.
ROCHESTER, N. Y.

There has been considerable interest of late in various methods of producing artificial hyperthermia in patients. A comparison of three available "electrical" methods was undertaken in this laboratory in order to study the specific effects, if any, to simplify the procedures used and to reduce the cost of installation and operation of the equipment, if possible. Various workers have reported the use of (*a*) hot baths,[1] (*b*) "diathermy currents" (1,000 kilocycles[2]), (*c*) radiothermy (10,000 kilocycles[3]), (*d*) enclosed bags containing heaters,[2e] and other methods. Many physicians have utilized chemicals or bacterial products for producing fever. Malaria has had a wide usage, mainly because of the apparent simplicity of the clinical procedure. Careful observation of the latter method, however, has demonstrated many of the concurrent physiologic changes common to all methods (blood pressure fall, cardiac or respiratory embarrassment and the like). There are some disadvantageous after-effects of the malarial infection (anemia, intoxication, rupture of the spleen), which are absent when purely electrical methods are used to raise body temperature. The chief disadvantages of the electrical methods for producing fever artificially are the expense of the equipment and the danger of burns (which can be avoided, in the main, by suitable technic). In different clinics there is considerable variation in the height to which the body temperature is elevated as well as the duration of the maximum temperature. Some workers elevate the temperature of the patients to a certain point, usually from 40.5 to 41 C. (104.9 to 105.8 F.), after which they allow the temperature to come down spontaneously, or they delay this fall by the use of hot water bottles or heat pads and blankets. Some imitate the paroxysms of malaria (multiple treatments with short intervals between), while others may give more or less prolonged fever periods with long intervals between them.

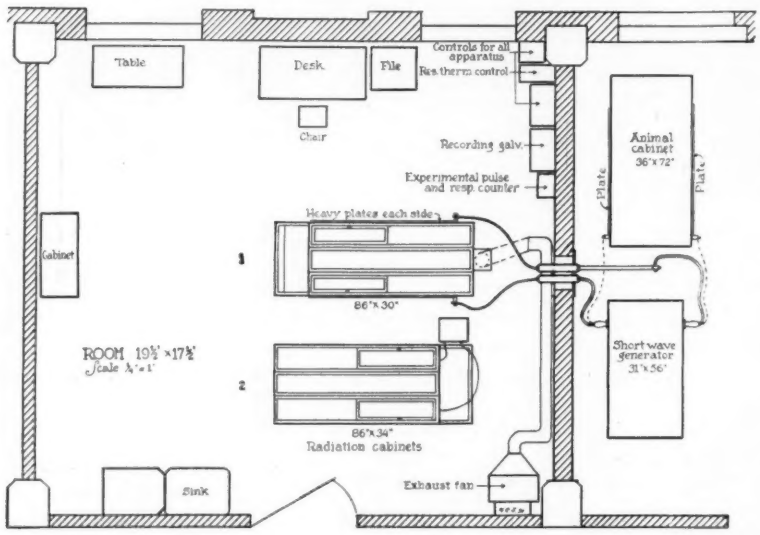

Fig. 1.—Diagram of treatment room, showing arrangement of cabinets, oscillators and control apparatus.

Those employing high frequency currents for the production of therapeutic fevers have applied two widely different frequencies—one relatively low, around 1,000 kilocycles (300 meters), as generated by the ordinary diathermy machine; the other relatively high, 10,000 kilocycles (30 meters), as produced by tube oscillators (radiotherm). Those using the lower frequency apply the current to the patient by means of metallic electrodes held in contact with the body by various jackets or binders. The patient is covered with blankets or encased in an insulating bag, and after the fever level is reached the current is shut off and the temperature allowed to fall spontaneously. Others place the patient in a high frequency field between the two large metal plates of the radiotherm, without actual contact, heating being accomplished by dielectric losses and induced currents. The patient treated by this type of equipment must have the moisture removed from the skin by some means in order to prevent burns if high temperature levels are to be reached.

If we are right in supposing, from our clinical results[4] and laboratory experiments,[5] that therapeutic fever is effective in certain infections because of the thermal death time, i. e., the time-temperature combination which is necessary to bring about the death of the infective agent,[5c] it makes but little difference which method of producing the fever is used, provided it can be controlled. It is necessary only to adjust the technic to conform to this principle. Such a concept entails

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From the Department of Medicine, Division of Radiology, of the University of Rochester School of Medicine and Dentistry.

We are indebted to Dr. W. R. Whitney, of the Research Laboratory of the General Electric Company, for his cooperation and advice, in addition to the loan of much equipment. Dr. C. M. Carpenter gave us many helpful suggestions concerning the experiments with the high frequency oscillator. Dr. McCann, Dr. Morton, Dr. Wilson and others of the clinical staff made available suitable patients for this test. Prof. T. R. Wilkins and B. O'Brien of the Department of Physics gave consultation and advice. Equipment was lent by Mr. Harry Gordon of the Rochester Telephone Corporation, Mr. Henry Klum of the Rochester Gas and Electric Company, Mr. Lamb of the Taylor Instrument Company, and Mr. Charles Renaud of the General Electric X-Ray Corporation. Mr. Herbert Mermagen gave technical assistance during the experiments with the high frequency oscillator.

1. Mehrtens, H. G., and Pouppirt, P. S.: Hyperpyrexia Produced by Baths, Arch. Neurol. & Psychiat. **22:** 700-708 (Oct.) 1929. Schamberg, J. F., and Tseng, H. W.: Am. J. Syph. **11:** 337-397 (July) 1927.

2. (*a*) Bishop, F. W.; Horton, C. B., and Warren, S. L.: Am. J. M. Sc. **184:** 515-533 (Oct.) 1932. (*b*) King, J. C., and Cocke, E. W.: South. M. J. **23:** 222-228 (March) 1930. (*c*) Neymann, C. A.; Feinberg, S. M.; Markson, D. E., and Osborne, S. L.: Arch. Physical Therapy **13:** 749-768 (Dec.) 1932. (*d*) Neymann, C. A., and Osborne, S. L.: The Treatment of Dementia Paralytica, J. A. M. A. **96:** 7-13 (Jan. 3) 1931; (*e*) Am. J. Syph. & Neurol. **18:** 28-44 (Jan.) 1934. (*f*) Perkins, C. T.: Am. Med. **26:** 546-552 (Sept.) 1931.

3. (*a*) Bierman, W.: Arch. Phys. Therapy **13:** 389-391 (July) 1932. (*b*) Hinsie, L. E., and Blalock, J. R.: Psychiat. Quart. **6:** 191-212 (April) 1932. (*c*) Hinsie, L. E., and Carpenter, C. M., ibid. **5:** 215-224 (April) 1931. (*d*) Neymann, Feinberg, Markson and Osborne,[2c] (*e*) Neymann and Osborne.[2e] (*f*) Simpson, W. M.; Kislig, F. K., and Sittler, E. C.: Ann. Int. Med. **7:** 64-75 (July) 1933. (*g*) Tenney, C. F., ibid. **6:** 457-468 (Oct.) 1932.

4. Bishop, Horton and Warren.[2a] Carpenter, C. M. and Warren, S. L.: New York State J. Med. **32:** 997-1001 (Sept. 1) 1932. Warren, S. L., and Wilson, K. M.: Am. J. Obst. & Gynec. **24:** 592-598 (Oct.) 1932.

5. (*a*) Bishop, F. W.; Carpenter, C. M., and Warren, S. L.: J. Exper. Med. **56:** 719-723 (Nov.) 1932. (*b*) Boak, R. A.; Carpenter, C. M., and Warren, S. L.: J. Exper. Med. **56:** 725-739, 741-750 (Nov.) 1932. Carpenter, C. M.; Boak, R. A., and Warren, S. L., ibid. **56:** 751 (Nov.) 1932. (*c*) Carpenter, C. M.; Boak, R. A.; Mucci, L. A., and Warren, S. L.: J. Lab. & Clin. Med. **18:** 981-990 (July) 1933. (*d*) Carpenter and Warren.[4]

a rather different method of approach to the problem of fever therapy; namely, the elevation of the body temperature to a predetermined temperature and its maintenance there for a specified length of time.

The routine in this clinic, in brief, consists in elevating the patient's temperature (rectal) during a period of from one to two hours to a level of from 41.5 to 41.7 C. (106.7 to 107 F.) and maintaining it there for five hours or longer, since it was found that this time-temperature relationship was generally efficacious, although any other procedure or time-temperature relation may be used if found to be therapeutically

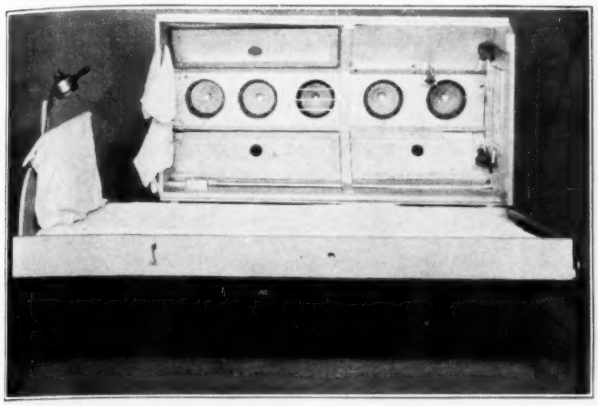

Fig. 2.—Radiant energy cabinet open, showing the simple arrangement of lamps with screens, which prevent contact with the patient.

effective. At the end of the interval the temperature of the patient is lowered by blowing cool air on the skin with a fan.

Temperature, pulse, respiration, blood pressure, heart sounds, color changes and the like are watched carefully throughout the procedure. The clinical procedure is essentially the same regardless of the method of producing the fever and has been described in greater detail in a previous paper [2a] in which the diathermy equipment was used.

The average ambulatory patient is rather tired following the treatment but is usually well enough to be discharged from the hospital the next day. The procedure is safe for the patient who is in fairly good general physical condition. Many different diseases have been studied and treated, and while the physiologic changes obtained both during and after the fever have been essentially identical with all three described methods, they are not within the scope of this report. The methods and apparatus used are now well organized, as far as general principles are concerned, and may be readily adapted to fit special conditions.

INSTALLATION OF APPARATUS

In order to evaluate the various electrical methods of elevating the temperature of a patient, the treatment room was equipped to meet all requirements. In one corner of the treatment room (fig. 1) is a wall-mounted control box, with a number of outlets controlled by various switches. All apparatus is controlled from this point. The box contains all necessary rheostats and meters. Above this control panel is a shelf which holds a duplex recording galvanometer and accessory apparatus for the resistance thermometer, a recording wattmeter, a watt-hour meter, and other equipment.

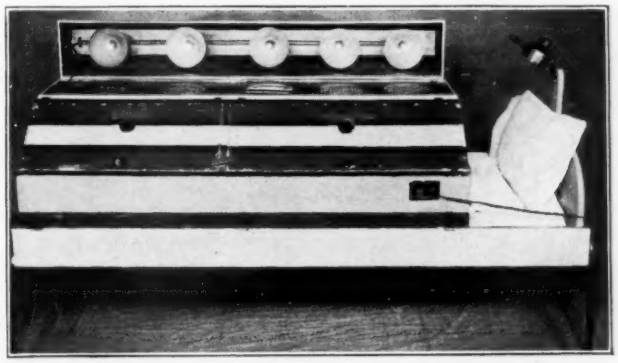

Fig. 3.—Box closed. Lamp housing hinged back provides accessibility.

The first type of apparatus used for the heating of the patient is an ordinary high power "diathermy machine," with a frequency of 1,000 kilocycles (300 meters) and an available current through the patient of from 5 to 6 amperes. This is applied to the trunk of the patient by means of large block tin electrodes. As pointed out in a previous publication,[2a] the method entails not only the efficient elevation of the patient's temperature but also its maintenance over a considerable period of time (five hours or more). Means must be provided to prevent the loss of heat by the patient during the rise and to compensate for the losses during the period of maintenance of his fever. Blankets (from eight to fourteen) and hot water bottles have been employed, but their use was soon discontinued because the blankets are heavy and cause a sense of restraint. They were also difficult to manipulate during the treatment for blood pressure, examinations, making of electrocardiograms, use of urinals, and change in position. Moreover, the laundry cost is high for the blankets, so that we use a heat-retaining chamber or cabinet by preference.

This "cabinet" consists of a shallow wooden box, which rests on the framework of the common hospital

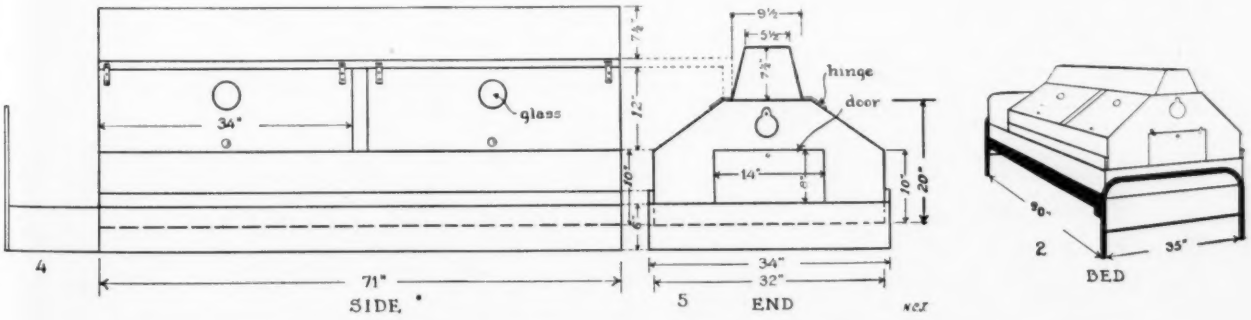

Fig. 4.—Dimensional and constructional details of radiant energy cabinet.

cot and contains a rubber-covered mattress measuring 80 by 200 cm. (31 by 79 inches). Hinged to this box is a light, somewhat coffin-shaped box made of cellotex, fastened to a wooden framework which, when closed, fits tightly around the mattress.[2a] The exterior has been gayly painted to lessen the sepulchral appearance. For use with the diathermy or low frequency equipment, the box was wired for eight 60-watt carbon filament lamps controlled by a rheostat. By this means the air surrounding the patient may be maintained at a temperature sufficiently high to compensate for losses of heat from the patient by radiation, sweating and the like. The head of the patient protrudes from one end of the box through a large opening provided for this purpose. Two pieces of terry cloth, cut to conform to the shape of the neck, are hung, one inside and one outside, of the box. Regardless of how the patient moves about, at least one of these is effective in closing the space around the neck. Fixtures for attaching restraining cuffs for the hands and ankles and the axillae are available. Two doors are provided on each of the sloping sides of the box to permit examination or manipulation of the patient during the treatment. Small windows allow observation of respiration and reading of any instruments within. Small holes are provided to permit the use of thermometers for observation of the air temperature, as well as for a recording rectal resistance thermometer kept constantly in the patient, and for electrocardiographic leads and the like. When the patient's temperature is at the desired height, the electrodes for the high frequency (diathermy) currents may be removed and the temperature maintained by the lamps.

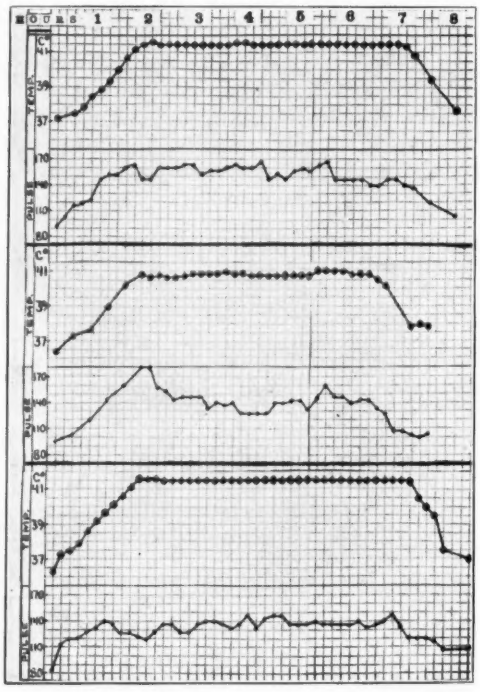

Fig. 5.—Comparison of normal curves obtained by the three methods of elevating body temperature. Upper, diathermy; center, radiothermy; lower, radiant energy.

The second method (radiotherm) employs a system of two 500-watt radio transmitting tubes, oscillating in a push-pull Hartley circuit at a frequency of approximately 10,000 kilocycles, or a wavelength of 30 meters. This circuit and the generator have been described by Page [6] and are similar to those used by Bierman,[3a] Hinsie and Carpenter,[3c] Neyman,[2e] Simpson,[3f] Tenney [3g] and others. With such high frequencies it is merely necessary to place the patient in some available part of the field of the oscillatory circuit, whereupon currents are set up in the body resulting in the generation of heat. The common method has been to place the patient on a stretcher on the oscillator housing, in the electrostatic field between the large protected plates supplied by the manufacturer as standard equipment. If the temperature of the patient is to be elevated to

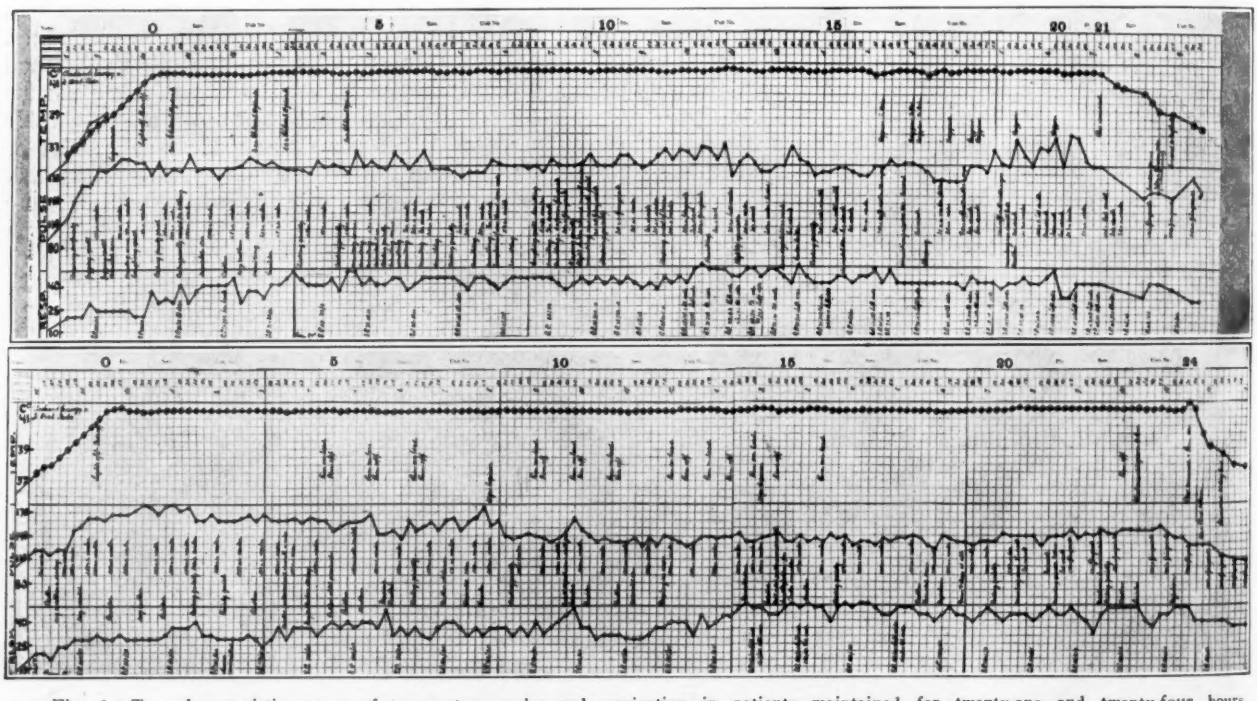

Fig. 6.—Two characteristic curves of temperature, pulse and respiration in patients maintained for twenty-one and twenty-four hours, respectively, at 41.5 C (106.7 F.) rectal temperature by the radiant energy method.

6. Carpenter, C. M., and Page, A. B.: Science **71**: 450-452 (May 2) 1930.

41.5 C. (106.7 F.) and kept at this level, it is essential for the patient to be under constant observation during the procedure. Since this temperature is near the upper limit of safety, it is necessary to make frequent temperature observations (every ten minutes). From the clinical standpoint the position of the patient is very unsatisfactory in such an arrangement, so that we have changed the setup somewhat by using a cabinet separated from the oscillator.

On account of limited space in the treatment room, the "short wave" (30 meter) oscillator is placed in an adjoining room (fig. 1) and is operated by remote control from the panel in the treatment room. The radio frequency conductors are brought through the 22 cm. (8½ inch) brick wall in porcelain tubular insulators. The leads through the wall are separated by a distance of only 8 cm. (3¼ inches), constituting, in effect, a radio frequency feeder system. Separation of the leads through the wall to any great extent results in large losses from absorption by the bricks. The conductors entering the treatment room terminate in sockets into which the leads from the patient's treatment cabinet are plugged. The length of each lead from the wall socket to the plate in the cabinet is 120 cm., through the wall 22 cm., and from the wall leads to the machine 100 cm., or 242 cm. total per lead.

The cabinet for use with the short wave (30-meter) machine is similar in shape to the one described.[2a] Several other arrangements may work satisfactorily, but we have found the use of a cabinet to be simple and convenient. This cabinet is also of cellotex and is shellacked to prevent absorption of moisture. It is mounted on a wooden frame on casters instead of a metal cot, because of the absorption of power by the latter material in a rapidly fluctuating field. The box and its surroundings should contain a minimum of metallic objects or other conductors (including paint). A mattress would accumulate moisture during the treatment, so that a canvas stretcher is provided, which has openings along the edges for the circulation of air. The space below the stretcher is enclosed and forms a duct through which warm or hot air may be forced. Within each of the double-walled sides of the cabinet is an aluminum plate, 25 cm. by 130 cm. by 1.5 mm. thick, which may be slid lengthwise for optimum orientation of the field in relation to the patient. These plates are 74 cm. (29 inches) apart and are connected to the high voltage terminals of the transmitting helix, thus forming part of the oscillatory circuit. It is, of course, as necessary as before to minimize heat losses. While heating lamps cannot be placed within the cabinet, it is still possible to warm it by other means and incidentally lessen the accumulation of moisture on the patient, which, because of its conductive properties, would allow currents to concentrate on the skin of the patient and produce burns. At the end of the air duct, beneath the stretcher and sufficiently far removed from the plates, are several resistance type heaters connected to the control panel on the wall by a cable. At the opposite end of the cabinet, and attached so as to remove the air from above the stretcher, is a 145 cm. (60 inch) length of 10 cm. (4 inch) semirigid rubber and canvas hose connected to an exhaust fan. Hot air is thereby drawn along and under and over the patient, constantly drying up perspiration, and the hot, humid air is removed from the cabinet and room. The cabinet may be lifted back on its hinges without interfering with the hose connection. The top of the cabinet has a removable panel, which can be replaced by a cellotex panel on which are mounted in a row six 60 watt carbon filament bulbs in standard parabolic reflectors. These lamps are put in place after the temperature of the patient has reached the desired level and the high frequency machine has been shut off, because the wires and reflectors shunt a large amount of energy from the patient. These lights can be controlled by their individual socket switches or by a rheostat and are sufficient to maintain the patient's temperature while he is in the cabinet. Windows and doors are provided, as in the first cabinet. A resistance thermometer or thermocouple cannot be used with this high frequency apparatus while the high frequency current is on. It is necessary to shut off the machine to take the rectal temperature, even with a standard mercury thermometer, or to listen to the heart or to take the blood pressure. When the patient's temperature has reached the desired level it can be maintained by using the radiation from the lamps in the removable panel, and any thermometer can be used. The moving hot air alone is insufficient to maintain the temperature level because of the heat loss due to the evaporation of sweat, unless high air temperatures (60 C. [140 F.] or more) are used. It is not desirable to continue the use of the high frequency currents during the long period of maintenance because of the danger of burns, although this technic is possible with suitable precautions.

A number of experiments were conducted to determine whether or not the alternating electromagnetic field from a solenoid energized by the high frequency currents had any particular properties that would give it an advantage over the ordinary high frequency electrostatic field. It was hoped that the currents induced in the body by this means might be of sufficiently low potential to permit the use of electrical thermometers and possibly reduce the danger of burns on the skin. Helices of sizes up to those permitting the insertion of the entire body were employed. While very high powers were not available, it was found that the electromagnetic field per se possessed no particular advantage over the electrostatic field as far as its applications to systemic fevers were concerned, although it seemed to have possibilities for local administrations. A fairly wide frequency range or spectrum was investigated. (The radiotherm was built and lent to us by the General Electric Company through the courtesy of Dr. W. R. Whitney.)

A third method (radiant energy), which now supersedes the others in our clinic, is the result of our observations that the use of the lights in the treatment box had a considerable accelerating effect on the rise in the patient's temperature. It was soon found that, with suitable changes in the cabinet, the temperature of the patient could be elevated by the use of the lamps in the box alone (radiant energy) without the use of any high frequency currents. This principle is old but is one that has not been much adapted to meet present requirements. It was suggested that the absorption of the infra-red radiation by the skin was largely responsible for the rise in the patient's temperature. Experiments were conducted to test this point. With other conditions remaining the same, the same bulbs in the box were painted black to reduce the shorter wavelength radiation but still allowing the air to be heated as before (from 50 to 60 C. [122 to 140 F.] during

elevation of temperature, and from 30 to 45 C. [86 to 113 F.] during maintenance). It was found that under these conditions the patient's temperature rose very slowly. Substituting clear bulbs of the same wattage for the painted ones caused a marked increase in the rate of rise of the patient's temperature without a significant change in the temperature of the air surrounding the patient. It was then decided to place more powerful bulbs in reflectors, mount them on the exterior of the box, and irradiate the patient through holes cut in the flat roof of the cabinet (figs. 2, 3 and 4). Five 200 watt, Robert Schwartz heating lamps are so arranged that three irradiate the trunk of the patient and two the lower extremities. Two smaller bulbs are mounted in the foot end of the box. This type of lamp was chosen because they are strong emitters of infra-red rays. Tungsten lamps of the same wattage were not so satisfactory. These lamps are controlled by a rheostat, since they deliver more energy than is usually required. The life of the bulbs is prolonged, since they are operated at less than their rated voltage. These changes were made in the first cabinet described, so that it can now be used either with the diathermy machine or with radiant energy alone.

COMPARISON OF METHODS

Since January 1930, 448 treatments have been given to 312 patients. The diathermy method was used for 157 treatments, the radiotherm for twelve treatments, on twelve patients, and the radiant energy method for 279 treatments. Three of these patients were treated with both the radiotherm and diathermy, with an interval of from one to three weeks between.

Since the results in this clinic seem to be identical, no matter what the method of elevating the temperature may be (fig. 5), a comparison may be based on cost and ease of use.

The first method requires a diathermy machine of fairly large power, representing an investment of from $200 to $900, with associated equipment such as electrodes and binders. There will be a certain cost of maintenance. Considerable time is required to apply the electrodes properly, as well as to readjust them if they become disarranged during the period of heating. If the electrodes become loosened through movements of the patient, electrical burns are likely to occur. In unstable or refractory (paretic) patients this is a potential danger. There may be variable upward coasting of the patient's temperature after the diathermy machine has been turned off (fig. 5), depending on the amount of heat temporarily stored in the tissues through which the current has been passing. The energy applied by this method is rather localized, and the rise in general temperature is brought about by the circulation of the heated blood to other parts of the body.

There is usually some fall in the patient's temperature when the box is opened to remove the electrodes. This has to be made up subsequently. With this method a higher pulse rate is noted (fig. 5) (10 per cent average above patients heated by infra-red radiation only), and it is believed to be due to a greater heating of the heart and lungs by the passage of the current through them, or due to the patient's apprehension from restraint of the chest (electrode binder).

Considering the method that employs the short wave oscillator, radiotherm, we find that the initial investment is very high. This equipment has the advantage over the directly applied electrode method in that the patient is not so restrained. The small number of actual treatments utilizing the radiotherm represents six months' active experimentation with this procedure. The effect of varying the electrode size and distance, their position in relation to the body, and major changes in wavelength were studied. Efficient methods of passing hot air over the patient and eliminating excessive cooling by the rapid evaporation of the sweat had to be worked out. All this was expensive and time consuming. After the greatest simplification was achieved (fig. 1), the equipment was still cumbersome and difficult to manage from the nursing standpoint in contrast to the other methods. The equipment was satisfactory for lower ranges of fever temperature, and several lower powered oscillators have been constructed in this laboratory and used with very satisfactory results for local applications.[7] The safety of the patient at the high level of 41.5 C (106.7 F., figs. 5 and 6), where sudden elevation to dangerous temperatures (42 C. [107.6 F.] or above) may occur, demands frequent temperature observations. This is difficult to do with the current on, and the high frequency currents must be shut off for the rectal temperature to be taken. The mouth and axillary temperatures are unreliable. We feel, however, from our rather extensive experimentation with this equipment in patients, on ourselves and in animals, that the clinical results obtained are based, in the main, on the heat produced in the body of the patient and are no different from those obtained by any other electrical method of elevating the temperature. While little is actually known about the temperature gradients occurring in patients treated by the radiotherm, we believe that, if any selective heating of an organ is brought about by a difference in its electrical characteristics, the effects are neutralized by the blood flow. Aside from this, it would seem a difficult matter to utilize any specific heating effects, even if they can be demonstrated on excised tissue,[8] since the intensity and orientation of the field (and consequently the heating) varies so much from patient to patient and to a great degree in the same individual if his position in respect to the plates is changed.

In the third system under consideration radiant energy (infra-red and visible radiation) is applied to the skin over a large area. The distribution of heat is brought about in the same manner as all other methods; i. e., the circulation of the warmed blood to other parts of the body. The heat transfer of the method is comparatively rapid, since the blood is so diffusely distributed over the whole body in the capillary bed of the skin that it is readily heated by the absorption of the radiant energy. The temperature rise starts immediately after the patient is exposed to the radiation and the rise is uniform and ceases practically at once when the radiation is turned off. The fact that there is little or no upward coasting of the patient's temperature when the radiation is turned off indicates that the blood stream conveys the heat away about as fast as it is supplied, and therefore the skin temperature is not excessively raised (maximum 43 C. before sweating begins). Blisters may be produced if the energy input is pushed too far in some area of decreased cir-

7. Bishop, F. W.: Radiology **21**: 487-491 (Nov.) 1933.
8. McLennan, J. C., and Burton, A. C.: Canad. J. Research **5**: 550-556, 1931. Schereschewsky, J. W.: Pub. Health Rep. **48**: 844-858 (July 21) 1933.

culation (scars, edematous areas and the like), or if some part should come too close to the lamps. These can be avoided if a towel or sheet is placed over the part as soon as a hyperemia is noted. Any method that applies energy diffusely over a large area of the body automatically reduces the danger of too great concentration and consequently burns. It seems obvious from a physical standpoint, physiologic processes (sweating) being disregarded, that to raise the temperature of a patient of a certain weight to a given degree it will require the absorption and retention of a definite amount of energy. For example, assuming 0.83 as the average specific heat of tissue and $h = 0.24\ I^2Rt$ (Joules law), to raise a 60 Kg. patient 5 degrees C. in one and a half hours would require an effective energy of approximately 200 watts continuously applied during the interval, or 300 watt hours.

The energy put into our cabinet (from 0 to 1,000 watts) is ample to overcome all such losses as the evaporation of sweat, the heating of the box and enclosed air, and heat losses from all other causes, with sufficient reserve to supply the 200 watts or more necessary to raise the patient's temperature the required number of degrees in the specified time. Two or three ordinary electrical heating pads embedded in the mattress are sometimes used to prevent a possible heat loss in this direction. In practice their influence is slight, since the box and mattress are preheated by the lights and the mattress is a rather poor heat conductor. Humidity control of the air in the radiant energy cabinet was investigated and was found to be of little benefit in the set-up described, especially in view of the complications that it imposed.

The use of radiant energy has also made it possible to extend the period of fever greatly at any given height (from twenty-one to twenty-four hours) (fig. 6). Any rise or fall in rectal temperature may be compensated for very simply and quickly by use of the rheostat. The simplicity of the equipment enables one to administer to the comfort of the patient somewhat, such as by changes in position, pillows and rubber rings, and to foresee and handle sudden changes in condition. It is possible to direct a small electric fan at the patient's head and let him have cracked ice at intervals, since the heat loss from this cause can be made up easily. The cost ($150) entails the building of a suitable cabinet wired for the lamps and the purchase of a rheostat. The usual thermometers, blood pressure equipment, oxygen tank and records complete the equipment. A standard indicating or registering resistance thermometer may be purchased for from $150 to $300 from several instrument makers. A constant indication of the rectal temperature aids greatly in manipulating the heat input to maintain the rectal temperature at a desired level (fig. 6).

SUMMARY

1. While any of the electrical methods proposed can be made to work efficiently and safely in artificial hyperthermia, the radiant energy (infra-red) method described seems to be the most convenient and economical method in our experience.

2. There does not appear to be any difference in the clinical effects and results from the various methods used.

3. All these methods rely on the circulation of the blood for the redistribution of heat in the body from the site of application of the energy.

260 Crittenden Boulevard.

Clinical Notes, Suggestions and New Instruments

CASE OF DINITROPHENOL POISONING WITH RECOVERY

J. C. GEIGER, M.D., SAN FRANCISCO
Director of the Department of Public Health

B. L., a girl, aged 18 years, admitted to the Central Emergency Hospital, Department of Public Health, Dec. 6, 1934, at 6:30 p. m., had taken twenty-four reducing capsules with suicidal intent.

On physical examination the patient's face was flushed, the respiration rate was rapid and short, from 38 to 40 per minute, the pulse was 144, and the temperature was 103.4 F.

Routine gastric lavage was done with a 5 per cent solution of sodium bicarbonate. The symptoms being those associated with an overdose of alpha-dinitrophenol, the patient was placed in an ice pack in order to bring down the temperature. This was repeated whenever the temperature went over 101 F. Oxygen was administered at intervals that evening, and 500 cc. of dextrose was administered intravenously.

The patient slept at intervals the first night, and the next night she complained of being hungry but vomited after taking some food. The patient's condition was much improved the second day. She took fluids freely, retained them, and felt very much better. Recovery continued uneventfully and the patient was discharged at 4 p. m., December 8.

The patient, in describing symptoms afterward, stated that during the entire time she felt as if she were on fire.

At no time was consciousness lost, and there was little or no pain evident during the stay in the hospital.

Dinitrophenol was found in the gastric contents on laboratory examination.

Civic Center.

A CLINICAL STUDY OF BILIARY SECRETION IN A CASE PRESENTING A COMPLETELY OBSTRUCTED COMMON DUCT

LAWRENCE B. SHELDON, M.D., DALLAS, TEXAS

This case is of interest because it enabled me to study accurately the biliary secretion for a period of three months.

REPORT OF CASE

A white woman, aged 65, had had a cholecystectomy five years before, at which the gallbladder with several hundred small stones was removed. Following the operation she was symptom free for about three and one-half years. Then for the next eighteen months she suffered from intermittent attacks of severe pains in the upper part of the abdomen. A marked jaundice and septic-like temperature as high as 104 F. was associated with these attacks. It was at this stage that the patient came under observation. A diagnosis of common duct obstruction was made. The patient was prepared for surgical intervention by the administration of calcium salts, intravenous dextrose and hypodermoclysis of saline solution. At operation a markedly dilated common duct was found with complete obstruction at the point of entrance into the duodenum. The surgeon was unable to pass a probe through the stricture. A T tube was inserted into the common duct and large amounts of purulent bile were drained freely. Following the operation the patient improved rapidly and each day the bile became less purulent. The T tube was left in for a period of three months, and it was during this interval that the clinical studies were made.

The following conditions were present, which made this an unusual case for the study of biliary secretion:

1. The gallbladder had been removed five years previously. The hepatic ducts had had sufficient time to dilate and if possible to assume partially the functions of the gallbladder. The hepatic ducts were demonstrated to be dilated by an x-ray study in which skiodan had been injected into the common duct by the T tube. (It was interesting to note the precordial type of pain, anginoid in character, that was experienced by

the patient when too great pressure was used in filling the duct.)

2. A complete occlusion of the common duct had occurred just proximal to its opening into the duodenum. Thus, none of the bile secreted by the liver could pass into the duodenum. This complete obstruction was demonstrated at the time of operation by the x-ray study with opaque mediums injected into the ducts and by clinical observation over a period of three months. During this time the stools were always colorless and several chemical tests for bile were negative.

3. The T tube inserted into the common duct made it possible to collect and measure all the bile secreted by the liver, thus overcoming the inaccuracy of collecting bile specimens through the duodenal tube. I was aware of the fact that this liver was not a normal one and that impaired function

TABLE 1.—*Hourly Variations and Relationship to Meals*

Breakfast	8 a.m.		
	9	45 cc.	45 cc.
	10	30 cc.	30 cc.
	11	30 cc.	38 cc.
	12 m.	45 cc.	30 cc.
	1 p.m.	15 cc.	33 cc.
Dinner	1:30 p.m.		
	2	38 cc.	30 cc.
	3	30 cc.	45 cc.
	4	30 cc.	45 cc.
	5	38 cc.	24 cc.
	6	30 cc.	45 cc.
Supper	7 p.m.	34 cc.	30 cc.
	8	30 cc.	30 cc.

with a hepatitis was present, the result of a long standing infection within the biliary system. If cholagogues have a place in therapy, such a condition should be one of the indications for use.

STUDIES

1. The hourly variations and relationship to meals are given in table 1. A general diet was given with no restrictions of ordinary fats such as butter and cream. Fried and greasy foods were avoided. There seemed to be little change in the rate of flow when measured hour by hour. Foods ingested caused no appreciable variation.

2. A comparison of the day and night volume of bile is given in table 2. The volume was slightly larger during the night period between 8 p. m. and 8 a. m., the amount not being great enough to be of any significance. There seemed to be a little

TABLE 2.—*Comparison of Day and Night Volume of Bile*

	Day 8 A. M.-8 P. M.		Night 8 P. M.-8 A. M.	
Monday	315		255	
Tuesday	300		345	
Wednesday	270		300	
Thursday	355	Average 293	255	Average 330
Friday	300		360	
Saturday	255		360	
Sunday	257		315	

relationship in the total twenty-four volume in that a lower day output seemed to be offset by a greater night and a greater day volume by a lower night volume.

3. The daily twenty-four hour volume variations with the patient ambulatory and on a general diet were 632, 871, 665, 677, 721, 690, 542, 633, 521 and 608, an average of 656 cc. The average bile flow during this trial period of ten days with no medication was a little higher than the average daily flow of the whole experimental period, which was 624 cc. daily.

4. Stimulation with bile salts, plain, 30 grains (2 Gm.) daily, resulted in the following volumes: 592, 577, 682, 617, 675, 652 and 622, an average of 631 cc. No appreciable change was noted during this period.

5. Stimulation with a compound consisting of bile salts, 2½ grains (0.16 Gm.), cascara extract, one-half grain (0.03 Gm.), and phenolphthalein, one-half grain, given three times a day, resulted in daily volumes of 660 and 602, an average of 631 cc.

Because of general discomfort, abdominal pains and cramping I was unable to carry the study for a longer period.

6. Tincture of belladonna was administered to the patient until tolerance was determined, and then the twenty-four volume was measured, giving the following results: 615, 604, 691, 633 and 608, an average of 626 cc. This compared favorably with the average volume during the control period.

7. Sodium salicylate, 38 grains (2.5 Gm.) daily, resulted in 570, 585, 542, 570, 683 and 541, an average of 598 cc. of bile.

CONCLUSION

From the studies made in this case there is no evidence that the dilated hepatic ducts had assumed any of the functions of the gallbladder. The rate of bile flow was almost constant, whether measured hourly or daily. No appreciable change was noted following meals, nor was increased flow noted after the administration of bile salts plain, bile salts compound, sodium salicylate or tincture of belladonna.

1606 Medical Arts Building.

Special Article

GLANDULAR PHYSIOLOGY AND THERAPY

DIABETOGENIC, THYROTROPIC, ADRENOTROPIC AND PARATHYROTROPIC FACTORS OF THE PITUITARY

J. B. COLLIP, M.D.
MONTREAL

(Concluded from page 832)

NOTE.—*This article and the articles in the previous issues of* THE JOURNAL *are part of a series published under the auspices of the Council on Pharmacy and Chemistry. Other articles will appear in succeeding issues of* THE JOURNAL. *When completed, this series will be published in book form.*—ED.

THE PANCREATROPIC HORMONE OF THE PITUITARY

Although Koster [92] states that the pancreas of hypophysectomized dogs is usually atrophic, no specific changes have been observed in the islands of Langerhans that would prove a regulatory influence of the hypophysis on the endocrine activities of the pancreas.

Anselmino and Hoffmann [93] have recently stated that administration of anterior pituitary extracts increases the size and number of the islands of Langerhans in the pancreas of the rat. They believe that this effect is due to a specific pituitary hormone, for which the name "pankreatrope Substanz" (pancreatropic substance) has been suggested. Further experiments by the same authors [94] indicate that this principle leads to a (very slight) decrease in the blood sugar of dogs and rabbits. In the rat the liver glycogen disappears almost completely after an amount of pancreatropic substance equivalent to 10 mg. of anterior lobe tissue. The authors conclude that this hormone stimulates the insulin production of the islands of Langerhans.

92. Koster, S.: Experimentelle Untersuchung der Hypophysenfunktion beim Hunde, Arch. f. d. ges. Physiol. **224:** 212-216, 1930.

93. (*a*) Anselmino, K. J.; Herold, L., and Hoffmann, F.: Ueber die pankreatrope Wirkung von Hypophysenvorderlappenextrakten, Klin. Wchnschr. **12:** 1245-1247 (Aug. 12) 1933. (*b*) Anselmino, K. J., and Hoffmann, F.: Die pankreatrope Substanz aus dem Hypophysenvorderlappen; über die Darstellung und die Eigenschaften der pankreatropen Substanz, ibid. **12:** 1435-1436 (Sept. 16) 1933.

94. Hoffmann, F., and Anselmino, K. J.: Die pankreatrope Substanz aus dem Hypophysenvorderlappen; über die Stoffwechselwirkung der pankreatropen Substanz, Klin. Wchnschr. **12:** 1436-1438 (Sept. 16) 1933.

It is interesting in this connection that Aron [95] found that in guinea-pigs the intra-uterine injections of thyrotropic hormone during pregnancy will increase the number of the islands of Langerhans in the fetal pancreas. According to Anselmino and Hoffmann,[93b] however, it is not likely that their own results were due to the thyrotropic hormone, since their extracts were free of the latter.

NATURE OF THE DIABETOGENIC PRINCIPLE

Practically all workers in this field have noted that anterior pituitary extracts, purified to a greater or less degree, which have a diabetogenic effect on Houssay dogs, also produce an acetonuria in fasted normal or in fat-fed normal animals. The question arises, therefore, as to whether the ketogenic principle of the pituitary is the diabetogenic substance. We have had considerable experience in our laboratory in the fractionation of anterior pituitary extracts, and our own results have shown that the diabetogenic effect is retained by our purified growth hormone extracts and that our best thyrotropic hormone extracts contain varying amounts of ketogenic activity. We feel that our experiments on the ketogenic effects of anterior lobe extracts have established quite conclusively that the ketogenic effect is due to a substance separate and distinct from the thyrotropic principle. The fact that a purified extract rich in the thyrotropic and ketogenic principles, but free of growth principle, failed to cause an increase in the blood sugar or the excretion of sugar in the urine of a Houssay dog, whereas a purified growth extract containing only traces of the latter principles caused a marked increase in the fasting blood sugar level and in glycosuria, is, we think, absolute proof that the substance acting on blood sugar is different from the ketogenic hormone. Also this growth extract has been shown to antagonize insulin in the normal rabbit, whereas no such effect was obtained with the thyrotropic ketogenic extract.

We may conclude that the diabetogenic effect of the anterior pituitary is due to the combined action of two substances, one acting on the blood sugar level and the other producing ketosis.

The work of our laboratory on antihormones has helped greatly in the solution of the problem of the nature of the diabetogenic action of the pituitary. We have shown that the ketogenic substance must be distinct from the thyrotropic principle.[96] Animals injected over long periods with ketogenic extracts have become resistant to it, and the serum of these resistant animals has been shown to antagonize the effect of ketogenic extracts in other animals. Such serums have also antagonized the thyrotropic hormone, but this has been due to the presence of both principles in the extracts used to produce the resistant state.

Recently we treated a pancreatectomized dog with an anterior pituitary extract rich in both the growth and the ketogenic principle for a period of four months. Insulin was then withdrawn. For a period of one month therafter the animal showed no increase in acetonuria. Marked hyperglycemia and glycosuria were present. The animal was in good health and in fact resembled the typical Houssay animal. The animal was killed thirty-seven days after the withdrawal of insulin and the completeness of the pancreatectomy established. The liver glycogen was 1.8 per cent.

95. Aron, M.: Injections d'extrait préhypophysaire au foetus de cobaye in utero: Action sur les ilots endocrines du pancréas, Compt. rend. Soc. de biol. **113:** 1071-1073, 1933.

96. Black, P. T.; Collip, J. B., and Thomson, D. L.: The Effect of Anterior Pituitary Extracts on Acetone Body Excretion in the Rat, J. Physiol. **82:** 385-391 (Oct. 17) 1934.

II. THE THYROTROPIC PRINCIPLE

The interrelationship between the pituitary and the thyroid, which recent work has established so definitely, was suggested first by Rogowitsch,[97] who noted enlargement of the pituitary of dogs and rabbits following thyroidectomy. Rogowitsch's observation has been confirmed repeatedly. A significant increase in the size of the pituitary has been observed in cases of cretinism, myxedema and cachexia thyreopriva (Boyce and Beadles,[98] MacCallum and Fabyan,[99] Wegelin [100]). Adler [101] discovered that cauterization of the hypophyseal anlage in larval amphibia prolonged the larval state. Coincident with this, Gudernatsch [102] found that precocious metamorphosis was induced in tadpoles by thyroid feeding. Allen,[103] using the Adler technic for removal of the pituitary, showed that the delayed metamorphosis of hypophysectomized tadpoles was associated with scanty deposition of colloid in the thyroid. The Smiths [104] reported that the thyroid of hypophysectomized tadpoles became extremely atrophic and that repair of the thyroid could be brought about by homotransplants of pituitary or by intraperitoneal injections of extracts of bovine anterior pituitary. Spaul [105] produced hypertrophy of the thyroid and acceleration of metamorphosis by injections of anterior pituitary substance. Uhlenhuth and Schwartzbach [106] showed that salamander larvae injected with anterior pituitary extracts consumed 40 per cent more oxygen than normal larvae. The classic work of P. E. Smith [107] on hypophysectomy of the rat established quite conclusively that the thyroid is dependent on the stimulating action of the pituitary; associated with the atrophy of the thyroid of the hypophysectomized rat, Foster and Smith [108] found that the metabolic rate was decreased as much as 35 per cent.

A close relationship between the pituitary and the thyroid has been demonstrated clinically. Cushing [109]

97. Rogowitsch, N.: Die Veränderungen der Hypophyse nach Entfernung der Schilddrüse, Beitr. f. path. Anat. u. z. allg. Path. (Ziegler's) **4:** 453-470, 1888-1889.

98. Boyce, R., and Beadles, C. F.: Enlargement of Hypophysis Cerebri in Myxedema with Remarks upon Hypertrophy of the Hypophysis Associated with Changes in the Thyroid Body, J. Path. & Bact. **1:** 223-239, 1892.

99. MacCallum, W. G., and Fabyan, M.: On the Anatomy of a Myxedematous Idiot, Bull. Johns Hopkins Hosp. **18:** 341-345 (Sept.) 1907.

100. Wegelin, C.: Zur Kenntnis der Kachexia thyreopriva, Arch. f. klin. Med. **254:** 689-709, 1925.

101. Adler, L.: Metamorphosestudien an Batrachierlarven: I. Extirpation endokriner Drüsen: A. Extirpation der Hypophyse, Arch. f. Entwcklngsmechn. d. Organ. (Roux's) **39:** 21-45, 1914.

102. Gudernatsch, J. F.: Feeding Experiments on Tadpoles: I. Influence of Specific Organs Given as Food on Growth and Differentiation: A. Contribution to the Knowledge of Organs with Internal Secretion, Arch. f. Entwcklngsmechn. d. Organ. (Roux's) **35:** 457-483, 1912; Feeding Experiments on Tadpoles: II. A Further Contribution to the Knowledge of Organs with Internal Secretion, Am. J. Anat. **15:** 431-480, 1914.

103. Allen, B. M.: The Relation of the Pituitary and Thyroid Glands of Bufo and Rana to Iodine and Metamorphosis, Biol. Bull. **36:** 405-417, 1919.

104. Smith, P. E., and Smith, I. P.: Repair and Activation of Thyroid in Hypophysectomized Tadpole by Parenteral Administration of Fresh Anterior Lobe of the Bovine Hypophysis, J. M. Research **43:** 267-283 (June-July) 1922.

105. Spaul, E. A.: On the Activity of the Anterior Lobe of the Pituitary, J. Exper. Biol. **7:** 49-87 (Jan.) 1930; Accelerated Metamorphosis of Frog Tadpoles by Injection of Extract of Anterior Lobe Pituitary Gland and the Administration of Iodine, ibid. **1:** 313-321 (April) 1923.

106. Uhlenhuth, E., and Schwartzbach, S.: Control of the Thyroid Function by the Anterior Lobe of the Hypophysis, Anat. Rec. **34:** 119, 1926.

107. Smith, P. E.: The Disabilities Caused by Hypophysectomy and Their Repair, J. A. M. A. **88:** 158-161 (Jan. 15) 1927.

108. Foster, G. L., and Smith, P. E.: Hypophysectomy and Replacement Therapy, J. A. M. A. **87:** 2151-2153 (Dec. 25) 1926.

109. Cushing, Harvey: Acromegaly from Surgical Standpoint, Brit. M. J. **2:** 1-9 (July 2) 1927; **2:** 48-55 (July 9) 1927.

stated that patients with hypopituitary conditions tend to have a subnormal metabolism. Graubner,[110] reviewing the reports of thirty-three cases of pituitary cachexia (Simmonds' disease) found that in each instance the thyroid was small and atrophic and frequently sclerotic.

Loeb[111] and Aron,[112] quite independently of each other, produced hyperplasia of the thyroid of the guinea-pig by means of anterior pituitary extracts. Numerous workers have reported since on the production of hyperplasia of the thyroid in a variety of laboratory animals: Janssen and Loeser,[113] Watrin and Florentin,[114] Grab,[115] and Junkmann and Schoeller[116] in the guinea-pig; Benedict, Putnam and Teel,[117] Houssay, Biasotti and Magdalena,[118] and Schittenhelm and Eisler[119] in the dog; Baumann and Marine[7] in the rabbit; Riddle and Polhemus[120] in the pigeon; Noether[121] in the hen; Schockaert[122] in the duck; Anderson and Collip[123] in the rat.

Hyperplasia of the thyroid of the guinea-pig has been demonstrated in vitro with the thyrotropic hormone by Eitel, Krebs and Loeser,[124] while Houssay, Biasotti and Magdalena[118] and Marine and Rosen[125] produced hyperplasia in homotransplants and autotransplants of thyroid tissue in animals injected with anterior lobe extracts.

It has been stated by some that thyrotropic hormone is present in urine (Aron and Klein[126]), while others have failed to substantiate this (Smith and Moore,[127] del Castillo and Magdalena,[128] Krogh and Okkels[129]).

The thyrotropic principle is not active by mouth and it is destroyed by boiling. Active extracts have been prepared in a variety of ways (Loeser,[130] Junkmann and Schoeller,[116] Anderson and Collip[131]).

It can be shown to be distinct from the maturity factor, which is usually present in greater or less amount in active extracts and by the fact that boiling destroys the physiologic action of the former but not of the latter principle.

It is different from the growth hormone, because the most sensitive test object, the recently hypophysectomized rat, fails to grow when injected even for long periods with the purified thyrotropic hormone extracts.

According to Loeser[132] the thyrotropic hormone leads to an increase in size of the adrenal cortex, but only in the presence of the thyroid.

THE PHYSIOLOGY OF THE THYROTROPIC HORMONE

The administration of adequate amounts of the thyrotropic hormone to normal animals results in the course of a few days in enlargement and hyperplasia of the thyroid. There is an increase in the metabolic rate (Siebert and Smith,[133] Verzar and Wahl[134]), increase in heart rate (Schittenhelm and Eisler[135]), exophthalmos (Schockaert,[122] Loeb and Friedman[136]), a reduction of the iodine content of the gland (Loeser,[130] Schockaert and Foster[137]), an increase in the alcohol-insoluble iodine of the blood (Closs, Loeb and MacKay,[138] Grab,[139] Schittenhelm and Eisler[135]), a depletion of liver glycogen and an increase in the acetone bodies in the blood (Eitel and Loeser,[140] Eitel, Löhr and Loeser[141]). The latter effect, as has already been shown, is due to the ketogenic and not to the thyrotropic principle. Verzar and Wahl[134] and others have shown that none of the signs of hyperthyroidism can be produced in thyroidectomized animals by injections of thyrotropic hormone extracts.

The average increase in metabolic rate that we have seen in normal rats of our colony, treated with the thyrotropic hormone, has been + 26 per cent. The administration of even massive doses of the hormone

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does not result in higher values. We obtained quite different results, however, with a small series of goitrous rats. A control animal in this group had a thyroid gland weighing 142 mg. as compared with a normal rat's gland of 20 mg. The gland proved, on microscopic examination, to be extremely hyperplastic. The control metabolic rates of these animals were slightly subnormal. Immediately following treatment with thyrotropic hormone the metabolic rate rose rapidly. One animal showed a 95 per cent increase within twenty-four hours. The highest rate observed in the group was 162 per cent of the normal. This was on the ninth day of injections. All the rats showed definite symptoms of hyperthyroidism, irritability, weakness, exophthalmos and excessive sweating, and there was a 20 per cent loss of weight in the course of nine days.

Our hypophysectomized rats show a decline in the metabolic rate to an average of 74 per cent of normal as determined on a series of 118 of our experimental animals. The thyroid gland decreases in weight and the microscopic picture is one of marked involution of the cellular elements. We have found that these animals are much more sensitive to injections of the thyrotropic hormone than are normal animals. They compare very favorably in this respect with the guinea-pig. The metabolic rate has frequently been restored to normal within a week with doses twice a day of as little as 0.005 cc. of a purified thyrotropic extract. (The normal rat has required at least 0.08 cc. twice a day to show a significant rise in metabolic rate.) We have chosen as an arbitrary unit of the thyrotropic hormone the minimum amount, administered daily in two injections, which will cause a rise of 20 per cent in the metabolism of the hypophysectomized rat by the fourth day. We believe that this unit compares fairly well with the Junkmann-Schoeller unit as determined by the use of the normal guinea-pig, but it has this advantage: that the metabolism of the hypophysectomized animal, both before and during treatment, is far less variable than the histologic picture of the guinea-pig's thyroid. The normal guinea-pig thyroid is extremely sensitive to the thyrotropic hormone stimulus, but unfortunately control animals all too frequently, in our experience, have shown mild thyroid hyperplasia.

The thyrotropic principle causes an increase in the excretion of creatine in both the normal and the hypophysectomized rat (Pugsley, Anderson and Collip[142]).

The thyrotropic hormone, like thyroxine, causes an increase in the excretion of calcium by the intestine (Pugsley and Anderson[143]).

Marine and Rosen[125] produced exophthalmos in the thyroidectomized guinea-pig with acetic acid extracts of anterior pituitary powder. They were of the opinion that the anterior pituitary product stimulated centers in the midbrain controlling the sympathetic innervation of the eye.

A number of workers who have made injections over long periods of anterior pituitary extracts containing the thyrotropic hormone have noted a decrease in the size of the thyroid and a decrease in the metabolic rate of the treated animals (Korenchevsky,[144] Siebert and Smith,[133] Lee and Gagnon,[145] Verzar and Wahl,[134] Evans and Sarka[146]).

Retrogressive changes in the thyroid of guinea-pigs and ducks treated with anterior pituitary extracts over a long period have been described by Aron,[147] Loeb and Friedman,[148] Schockaert,[122] Thurston,[149] Friedgood,[150] and Collip and Anderson.[151] The latter found by the thirty-seventh day after daily injections of purified thyrotropic extracts that the metabolism of a group of normal rats had fallen 29 per cent below normal, which was approximately the level of metabolism for the hypophysectomized rats of the same colony.

It was shown that the loss of response to the thyrotropic hormone by the rats that had been injected for some weeks was due to the presence in their blood of a specific inhibitory substance. Proof of this was obtained by injecting both normal and hypophysectomized rats with blood serum obtained from the thyrotropic hormone resistant animals. These animals were then shown to be resistant to the injections of known potent hormone extracts.[152]

Blum[153] described an antithyroid effect of a blood constituent, which he called "katechin." Anselmino and Hoffmann[154] have prepared a lipoid fraction from normal blood and tissue which they assert has the physiologic properties of the Blum substance. They report that their blood extract inhibits the thyrotropic hormone as well as thyroxine, and they have also seen an inhibition of the histologic reaction of thyroid hyperplasia in animals injected with thyrotropic hormone and fed the antithyroidin extract. Abelin and Wegelin[155] found that simultaneous injections of diiodotyrosine with anterior lobe extract prevented the marked hyperplasia of the thyroid seen when the latter alone was injected.

The relationship, if any, of this substance of Blum to the thyroid stimulating principle of the anterior pituitary is not clear, but it is obviously a different substance from the antagonist principle found in the blood of thyrotropic hormone resistant animals.

It may be concluded that the thyrotropic principle found in anterior pituitary extracts is an entity having physiologic properties that distinguish it from the

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152. (*a*) Collip, J. B.: Some Recent Advances in the Physiology of the Anterior Pituitary, J. Mount Sinai Hosp. **1**: 28-71 (May-June) 1934; (*b*) Inhibitory Hormones and the Principle of Inverse Response, Ann. Int. Med. **8**: 10-13 (July) 1934. (*c*) Pugsley, Anderson and Collip.[149] Anderson and Collip.[131] Collip, J. B., and Anderson, Evelyn M.: Studies on the Thyrotropic Hormone of the Anterior Pituitary, J. A. M. A. to be published.

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growth factor, the ketogenic principle, the maturity principle, and—as will be seen later—from the adrenotropic hormone.

III. THE ADRENOTROPIC (INTERRENOTROPIC) PRINCIPLE[156]

P. E. Smith[156a] showed that marked atrophy of the adrenal cortex took place following hypophysectomy in rats and that this degenerative change could be prevented or the normal condition restored by intramuscular implantations of fresh rat hypophyses. Evans[157] confirmed Smith's work and reported adrenal cortical repair by the use of purified growth extracts.

In this connection one might call attention to the marked atrophy that follows the destruction of the hypophysis in patients (Fahr,[158] Jaffe and Tannenberg[159]), and to the frequent occurrence of cortical hypertrophy associated with pituitary tumors (Wieth-Pedersen[160]), particularly with acromegaly (Salmon[161]).

In our work it was noted that the adrenotropic effect tended to be associated with thyrotropic effect but that with further purification of the thyrotropic principle the adrenotropic action became less. This led us to attempt to obtain the adrenotropic principle in greater amount and the thyrotropic in less amount by working up the tailings from the thyrotropic extracts. We were in this way successful in obtaining a fraction that was strong in adrenotropic activity and in the doses used was free of thyrotropic effect (Collip, Anderson and Thomson[162]).

There is as yet no satisfactory physiologic test for the adrenotropic principle; for, since the adrenal cortex reacts with hypertrophy after the administration of numerous nonspecific toxins, the results obtained on normal animals (Houssay and his co-workers,[163] Anselmino and his associates,[164] Emery,[165] Robson and Taylor[166]) are not conclusive, and the hormone must always be tested on hypophysectomized animals. However, the observations of Putnam and his associates,[167] who observed real cortical adenomas after the chronic administration of alkaline pituitary extracts, were very suggestive. I also have to mention in this connection the important recent observations of Houssay and his associates,[168] who were able to stimulate the adrenal cortex of hypophysectomized dogs with pituitary extracts.

No marked effect on the medulla has been described, nor is there any definite evidence of atrophy of the medulla after hypophysectomy; but Houssay and his associates[163] found a depletion of its epinephrine content after pituitary extract administration in dogs. Two possible effects of the adrenotropic principle, apart from the cortical repair induced in hypophysectomized rats, are (1) a slight decrease in the positive potassium balance of normal animals (Pugsley[169]) and (2) an effect on the hemogram. Miss Margaret Hill, who has been making a study of the blood picture as influenced by pituitary extracts, has observed a very definite increase in the reticulocytes when large doses of adrenotropic extracts have been injected daily over a period of weeks. The reticulocyte response appears to follow a definite curve. The significance of this response is not clear as yet.

On theoretical grounds it is conceivable that certain cases of Addison's disease may be due to primary pituitary failure. In this connection it is of interest to mention that in two cases of Addison's disease very marked improvement has occurred when adrenotropic extract was administered. It is, of course, not to be expected that cortical tissue that has been damaged by tuberculosis can be activated by pituitary adrenotropic hormone.

IV. THE PARATHYROTROPIC PRINCIPLE

Clinical evidence for an interrelationship between pituitary and parathyroids has been reported by various investigators. The association of parathyroid adenomas with tumors of the pituitary glands was particularly suggestive of such a relationship (Hertz and Kranes[170]). More recently, several authors have assumed the existence of a special parathyrotropic hormone, the administration of which to normal animals leads to proliferation of the parathyroid cells (Hertz and Kranes,[170] Hoffmann and Anselmino,[171] Anselmino, Hoffmann and Herold[172]). The recent report by Hertz and Albright[173] that the urine of patients with hyperplasia of the parathyroids, but not of those with parathyroid adenoma, contains a substance that will produce hyperplasia in the parathyroids of normal rabbits, is of special significance.

EFFECT OF HYPOPHYSECTOMY ON THE PARATHYROID GLANDS

Aschner[42] found no changes in the parathyroids of his hypophysectomized dogs, but Koster[92] states that the parathyroids of hypophysectomized dogs are usually smaller than those of control animals. Houssay and Sammartino[174] frequently found degenerative changes in these glands after removal of the hypophysis; they emphasize, however, that similar changes may also be

156. As Evans (J. A. M. A. **104**: 464 [Feb. 9] 1935) has pointed out, the principle commonly known in the literature as the "adrenotropic" is more accurately designated "interrenotropic"; the present evidence indicates that it stimulates only the adrenal cortex ("interrenal gland").—ED.

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169. Pugsley, L. I., cited by Collip.[153a]

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172. Anselmino, K. J.; Hoffmann, F., and Herold, L.: Ueber die parathyreotrope Wirkung von Hypophysenvorderlappenextrakten, Klin. Wchnschr. **13**: 45 (Jan. 13) 1934.

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observed in the parathyroids of normal dogs. Similarly, P. E. Smith [175] reports parathyroid atrophy after hypophysectomy in the rat.

In our experience, the parathyroids of hypophysectomized rats and dogs show no consistent degenerative changes, even several months after removal of the pituitary. I must say, however, that we made no exact counts of the number of degenerated cells in the glands. The occasional finding of cell groups with pyknotic nuclei in the parathyroids is a physiologic occurrence both in the rat and in the dog and may easily be misleading.

It is of particular interest in this connection that the simultaneous removal of the hypophysis and the pancreas frequently leads to very marked degenerative changes in the parathyroids of the dog, according to Houssay and Biasotti.[38b] Similar observations have been made in our laboratory. In some cases large areas of the parathyroids became completely necrotic.

EFFECT OF HYPOPHYSECTOMY ON BLOOD CALCIUM

While Gerschman [176] found the blood calcium to be normal in hypophysectomized dogs, Geesink and Koster [17] found subnormal values. It should be noted, however, that the latter authors performed their experiments on very young animals, in which the calcium metabolism is always more easily disturbed. In amphibia, the blood calcium decreasing effect of hypophysectomy seems to be much more marked than in the higher forms of vertebrates, as judged by the observations of Hogben and his co-workers [177] and of Shapiro and Zwarenstein.[178]

EFFECT OF HYPOPHYSEAL EXTRACTS ON THE PARATHYROID GLANDS

Hertz and Kranes [170] have obtained a fraction, by acid extraction of beef pituitary, that leads to active mitotic cell division and vacuolization of the parathyroid cells in the rabbit. Almost at the same time, Anselmino, Hoffmann and Herold [172] published their results, showing that parathyroid enlargement may be produced in the rat by the administration of a pituitary extract. They attributed this effect to a parathyrotropic hormone (parathyreotropes hormon).

EFFECT OF HYPOPHYSEAL EXTRACTS ON BLOOD CALCIUM

Teel and Watkins [179] reported a fall in the blood calcium of the dog after treatment with pituitary fractions containing the growth hormone. Similar results have been obtained with hypophyseal extracts in rabbits by Hogben and Charles.[180] More recently, Hoffmann and Anselmino [171] reported an increase in blood calcium after the administration of their parathyrotropic extract. They concluded that the effect is due to the stimulation of the parathyroids, since their extracts had no effect after parathyroidectomy.

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The Guibor Stereoscopic Charts.

The charts may be used with the ordinary stereoscope which has a 5 prism diopter lens before each eye, the stereocampimeter, the correcteyescope, the kratometer, the synoptophore and similar instruments.

These charts provide a means for an intelligent and adequate orthoptic training technic, and objective and subjective examinations. The former is not discussed in the outline accompanying the charts, except to say that the motility, the angle gamma, and the angle of anomaly should be measured. The subjective examination, however, which the designer believes is very important, especially in the latent muscle anomalies, is discussed in detail.

These charts were tested in a clinic acceptable to the Council. The series were reported satisfactory, and the claims made for them conformed with the Official Rules of the Council. The Council on Physical Therapy voted, therefore, to include the Guibor Stereoscopic Charts for Adults and Children in the Council's list of acceptable devices.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS. PAUL NICHOLAS LEECH, Secretary.

CALOMELOL AND CALOMELOL OINTMENT OMITTED FROM N. N. R.

Calomelol, manufactured by the Heyden Chemical Corporation, with its dosage form, Calomelol Ointment, was accepted by the Council for inclusion in New and Nonofficial Remedies in 1909.

As long ago as 1919 the efficacy of calomel inunctions for treating syphilis was questioned (Cole, H. N., and Littman, Sidney: THE JOURNAL, Nov. 8, 1919, p. 1409). This clinical evidence was opposed by Schamberg and some of his co-workers. At a later date, studies on the excretion of mercury following calomel inunctions were made (Cole, H. N.; DeWolf, H. F.; Schreiber, N. E.; Sollmann, Torald, and Van Cleve, Joseph: *Arch. Dermat. & Syph.* **27**:1 [Jan.] 1933), showing that after 50 per cent calomel inunctions the urinary mercury excretion could be best compared to that which occurs after 5 per cent metallic mercury inunctions. At the end of four weeks there was a median mercury excretion of but 0.09 mg. The low urinary mercury excretion was explained as due to the difficulty of rubbing the hard particles of mild mercurous chloride into the hair follicles. Calomel inunctions are not suitable for treating syphilis.

In view of the foregoing, the Council, in its reconsideration of the product at the expiration of the last acceptance period in 1934, voted to omit these products from New and Nonofficial Remedies unless the firm should be able to supply evidence to justify their continued inclusion. The firm replied that it was not in position to supply new and convincing evidence as to the efficacy of Calomelol.

The Council therefore voted to omit Calomelol and its accepted dosage form from New and Nonofficial Remedies.

SHADOCOL NOT ACCEPTABLE FOR N. N. R.

"Shadocol" has been promoted extensively for oral administration in cholecystography by Davies, Rose and Co., Ltd., Boston. No formula is given on the package nor has any been found in that advertising which forms the basis of this report. However, the labels and advertising do divulge the fact that the preparation contains tetraiodophenolphthalein sodium, the substance for which the Council coined the shorter nonproprietary name tetiothalein sodium. The Connecticut Agricultural Experiment Station in Bulletin 363 (July 1934) reports the following composition (calculated from its analysis):

	per cent
Moisture	1.6
Disodium tetraiodophenolphthalein	16.7
Lactose	74.2
Anhydrous citric acid	5.3
Undetermined	2.2

It is claimed that this unoriginal mixture is "An improved form of orally administering sodium tetraiodophenolphthalein," that "It is an original product," that it is "the result of extensive research" and that it is "Imitated by others but equaled by none."

No evidence is presented to substantiate the view that dilution of the essential substance with milk sugar and citric acid gives "An improved form" of tetiothalein sodium for oral administration, nor is it evident how the product resulting from such dilution can justly be said to represent "the result of extensive research."

To avoid the confusion that is caused by the application of different names to the same substance, the Council does not recognize proprietary names unless they are applied by the discoverer of an article or by the one who discovers its therapeutic use, or with his consent. When the marketing of a product becomes open to general competition, the Council attempts to coin a convenient title for it, adopts this as the N. N. R. name, and then accepts the marketed brands only if they are offered under the N. N. R. name or the descriptive chemical name. In the case of tetraiodophenolphthalein sodium the Council adopted the contracted name tetiothalein sodium and adopted tests and standards for the control of products admitted to New and Nonofficial Remedies.

Davies, Rose and Co., Ltd., is not the discoverer of tetraiodophenolphthalein sodium and was not the first firm to make it available for therapeutic use. The marketing of this chemical in admixture with milk sugar and citric acid may not be claimed as a "discovery," nor of such fundamental importance as to justify the application of a special name. The Council is unable to recognize the name "Shadocol."

The addition of lactose and citric acid represents an unessential modification which is probably useless except as a commonplace flavor. It is fallacious to consider a modification of this sort as representing "an original product . . . the result of extensive research," and to claim that it is unequaled by other preparations.

The Council declared Shadocol not acceptable for New and Nonofficial Remedies because it is an unoriginal and unnecessarily complex mixture, marketed with exaggerated claims, under a proprietary, noninformative name, which is also misleading because it implies that the preparation is useful for casting x-ray shadows in general, when in fact the use of its principal ingredient, tetiothalein sodium, is restricted to the biliary tract.

Committee on Foods

THE COMMITTEE HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS. RAYMOND HERTWIG, Secretary.

ACCEPTANCE WITHDRAWN

RALSTON WHEAT CEREAL

Manufacturer.—Ralston Purina Company, St. Louis.

Description.—Essentially whole wheat with coarsest bran removed and added wheat embryo. The wheat embryo content is approximately twice that of whole wheat.

Manufacture, Analysis, and Vitamins.—See announcement, THE JOURNAL, July 9, 1932, page 135.

Violation of Agreement of Acceptance.—The company signed an agreement on Feb. 2, 1934, to observe the rule of the Committee on Foods to furnish regularly copy of all advertising for review. This rule is essential in order that the Committee may be assured that advertising for accepted foods is maintained in accord with its requirements as published in the Committee's Rules and Regulations and General Decisions. The submission of advertising in this manner involves little expense and does not interfere with the prompt release of advertising. There is no apparent reason why a company using truthful advertising should object to this requirement, and the Ralston Purina Company raised no objection to the rule in order that acceptance of its products might continue. Subsequent to the agreement, however, the advertising was not furnished, although the violation of the Committee rule and of the signed agreement was called to the attention of the company.

Discussion of Advertising.—Nonsubmitted advertising for Ralston Wheat Cereal, in addition, was found to conflict with Committee requirements for good advertising. Some typical false or misleading statements and claims are quoted:

"The children are so well since you started them eating Ralston. . . . It's wonderful to have them glad to eat the cereal child authorities prefer—the one I know is best for them. . . . In making boys and girls want to eat Ralston Wheat Cereal regularly he has had a splendid influence upon the health and well-being of millions of young Americans. . . . Turning Hero Worship into Health. . . . To be like Tom Mix . . . a million more boys and girls began to eat Ralston Wheat Cereal last year. Now they eat this double-rich hot cereal regularly. . . . Tom Mix has made children everywhere *anxious* to eat the hot whole wheat cereal which mothers, doctors, dietitians and teachers prefer for growing boys and girls! . . . NOW grateful mothers by the thousands write to say, 'It's wonderful what Ralston has done for *my* children!' RALSTON, double-rich in vitamin B, Does More than Any Ordinary Cereal to Build Strong Bodies. . . . Keep Appetites Eager. . . . Make Cheeks Rosy. . . . Provide Abundant Energy. . . . Build Resistance to Colds

and Disease. . . . Remember that—Mother! It's the reason why doctors, dietitians and school teachers in such overwhelming majority prefer this type of cereal— . . . Ralston Tastes So Good! You'll be delighted, too, and genuinely amazed to watch the difference in your child when he has the full value of finest whole wheat to build his body —the 'double-richness' in vitamin B to step up his appetite until he's really hungry for the nourishing foods he needs. . . . Every bowlful of Ralston gives your child the full benefit of . . . all the abundant body-building, energy producing qualities which make wheat our most important cereal food! . . . *And now Ralston does even more for your child!* Now it also provides a double quantity of vitamin B—which, science tells us, has exactly the same effect as sparkling western air upon appetites and health. Vitamin B *keeps* appetites normally eager—makes children want to eat wholesome, necessary foods . . . more satisfying, a richer source of quick energy. Do you wonder that children improve when they eat 'double-rich' Ralston regularly? Because cereal is one of the most important foods for growing children, an impartial, nation-wide survey has just been conducted. The sole purpose of the survey was to determine what type of cereal is preferred by authorities on child care. . . . Read the startling results which reveal that 84 out of 100 Child Specialists . . . 94 out of 100 Hospital Dietitians . . . 92 out of 100 School Teachers prefer a hot whole wheat cereal, enriched with extra vitamin B. . . . Doesn't this overwhelming preference answer any questions you may have about cereals? It proves that double-rich Ralston Wheat Cereal can do far more for your child than any *ordinary* cereal. How Ralston *is Building Better Health and High Ideals* among the children of America."

Ralston Wheat Cereal differs from whole wheat in containing less bran but more embryo; it is a good source of food-energy, vitamin B and iron, and a fair source of indigestible bulk. These contributions to the diet warrant emphasis and interpretation in advertising. Instead, the advertising misrepresents the food by presenting it as a special "health-food" for making children "well" or "like Tom Mix" (an athletic stalwart hero of the screen) for having "a splendid influence upon the health and well-being of millions of young Americans" and about which mothers exclaim "it's wonderful what Ralston has done for [our] children"; for "build[ing] strong bodies more than any ordinary cereal"; for "keep[ing] appetites eager, mak[ing] cheeks rosy, provid[ing] abundant energy, build[ing] resistance to colds and disease." Neither Ralston itself, any other single food nor the entire, well balanced diet possesses these potencies. Ralston cannot do these things claimed for it.

It is alleged that child authorities, doctors, dietitians, teachers "prefer Ralston," "prefer this cereal for growing boys and girls" or "in such overwhelming majority prefer this type of cereal." There are no authentic data showing that these professions prefer this food. The vagueness of such claims permits false interpretations that the product has been officially selected by the professions as superior to other cereals.

It is alleged Ralston is "double-rich," another type of claim which is misleading because of vagueness. The manner in which it is "double-rich" should be explicitly stated. The vitamin B content will not in any general sense "step up the appetite," "have the same effect as sparkling western air upon appetites and health," "*keep* appetites normally eager" or "make children want to eat wholesome necessary foods." It has not been shown that "Ralston can do far more for your child than any *ordinary* cereal." Lag in appetite may be due to many other causes than just insufficiency of vitamin B in the diet.

The advertising is false and misleading, a discredit to the product and to the company. Advertising standards in general are disrupted and lowered by advertising of this character. Ralston Wheat Cereal will therefore no longer be listed among the products accepted by the Committee on Foods.

ACCEPTANCE WITHDRAWN

WHEATENA

Manufacturer.—The Wheatena Corporation, Wheatenaville, Rahway, N. J.

Description.—Toasted granular wheat cereal composed essentially of the endosperm, the major portion of the bran and the embryo of red winter wheat. See announcement of acceptance, THE JOURNAL, May 2, 1931, page 1478.

Acceptance Withdrawn.—The manufacturer is not willing to furnish the Committee with copy of all pieces of new advertising in accordance with the requirement of its Rules and Regulations. Regular submission of advertising is necessary to assure the Committee that its requirements are being fulfilled. There is no apparent justifiable reason why the manufacturer of an accepted food who is using truthful and proper advertising should not be willing to furnish copy of all pieces of advertising, involving only nominal expense and time, for review by the Committee.

Since the manufacturer of this accepted food is not willing to comply with this simple requirement to assure that the advertising is being maintained acceptable, acceptance has been withdrawn.

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG, Secretary.

IRRADIATED VITAMIN D PASTEURIZED MILK

Distributors.—

Beatrice Creamery Company, Denver (Meadow-Gold).
Beatrice-Meadow Gold Dairies, Inc. (Champaign Sanitary Milk Division) Champaign, Ill. (Meadow-Gold).
Dixie Dairy Company, Gary, Ind.
Grisham Ice Cream Company, Corpus Christi, Texas.
W. D. F. Hayden Dairy Company, Dover, N. H.
Hutt's Dairy, Buffalo, Tonawanda, North Tonawanda and Amhurst, N. Y. (Bottler.—Wm. Weckerle & Sons, Buffalo).
Iowana Farms Milk Company, Davenport, Iowa.
Kleinheinz Dairy Company, Wausau, Wis.
Modern Dairy Company, La Crosse, Wis.
Prairie View Dairy Company, East Chicago, Ind.
Richmond Dairy Company, Richmond, Va.
The Supreme Dairy Company, Denver (Superb Quality and Supreme Quality Guernsey).
Thompson's Dairy, Washington, D. C.
Urbana Pure Milk Co., Urbana, Ill.
Virginia Dairy Company, Richmond, Va.

Description.—Bottled pasteurized vitamin D milk irradiated with ultraviolet rays.

Preparation.—The milk complies with legal requirements and is pasteurized by the standard holding method. For description of irradiation, see THE JOURNAL, Oct. 7, 1933, page 1155.

Vitamins.—Clinical investigation shows this milk to be a reliable antirachitic agent if the proper amount is used. Contains 135 U. S. P. X (Revised, 1934) vitamin D units per quart.

Claims of Distributors.—Irradiated antirachitic pasteurized milk having otherwise the flavor and food values of usual pasteurized milk.

WARRANTY SIEVED CARROTS

Manufacturer.—The Nielsen Corporation, Ltd., Oakland, Calif.

Description.—Sieved carrots prepared by efficient methods for retention in high degree of the natural mineral and vitamin values. No added sugar or salt.

Manufacture.—The carrots as received from the field are sorted, trimmed, thoroughly soaked, washed with a brush washer, and subsequently processed and canned by essentially the same procedure as described for Warranty Sieved Spinach (THE JOURNAL, Feb. 2, 1935, p. 399).

Analysis (submitted by manufacturer).—

	per cent
Moisture	88.9
Total solids	11.1
Ash	0.8
Sodium chloride	0.06
Fat (ether extract)	0.1
Protein (N × 6.25)	1.0
Reducing sugars as invert sugar	3.3
Sucrose	..
Crude fiber	0.7
Carbohydrates other than crude fiber (by difference)	8.5

Calories.—0.4 per gram; 11 per ounce.

Vitamins.—The method of preparation and processing insures the retention in high degree of the natural vitamin values.

Claims of Manufacturer.—Specially intended for infants, children and convalescents, and for special smooth diets. Only warming is required for serving.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, MARCH 16, 1935

COMPARISON OF MATERNAL DEATHS

Statistical inquiries perhaps are frequently viewed with more respect than may actually be warranted. When applied to medical subjects, statistics have the same significance as the x-rays: they are a means to an end, not an end in themselves. Thus the now numerous statistical studies dealing with maternal mortality must be analyzed as a laboratory test would be rather than serving merely as a basis for recriminations. The lesson of essential importance is not that the maternal mortality rate is higher in one country or district than another but that certain factors influence the death rate from this cause and that some of them may be favorably affected by the knowledge gained from statistical analysis.

In order to serve a useful purpose therefore statistics, like laboratory tests, must be both accurate and understood. The factors influencing the accuracy of vital statistics are twofold. The first of these is the clinical ground work. Without exact and uniform clinical diagnoses, statistical analysis is without value. This factor is well known, and exhaustive efforts to establish a firm clinical foundation [1] have been made in most studies. The other important element is the manipulation and interpretation of the statistical data obtained. This work is highly technical and requires special training in biometrical methods. Even when so applied, the modifying factors are so numerous and complicated that the apparent conclusions may not be real in fact.

One of the criticisms that have been applied to maternal mortality statistics is that the methods of assigning the cause of deaths associated with pregnancy and childbirth are different in different countries. The statistical comparability would naturally be greatly impaired by any differences of this character. This problem of classification of maternal deaths, however, has been recently investigated.[2] In order to obtain data that would throw light on the effect of differences in assignment procedure on the comparability of maternal mortality rates, it was planned to send to the bureaus of vital statistics in the principal foreign countries the pertinent information from 1,073 United States death certificates for 1927 on which pregnancy or childbirth was mentioned. It was to be requested that each office mark each death as puerperal or nonpuerperal according to its own method of assignment of cause. Actually, because of duplications, 477 certificates, selected to include at least one death of every type in the sample, were transmitted to twenty-four foreign countries. The information from these certificates, set up in list form with each line representing one death, consisted of the case number, age of the mother, primary and contributory cause of death, and performance or nonperformance of an operation and of a necropsy. It was asked that the first of these columns be checked if the death would be classed as puerperal and the second if it would be classed as nonpuerperal by the statistical bureau in charge of coding cause of death in each country. No information was given with regard to the cause assigned in the United States. On the return of the lists from sixteen countries the 596 deaths in the original group not sent abroad were reclassified as puerperal or nonpuerperal in accordance with the assignments made by the foreign countries for those which had been transmitted. The groups of deaths were then thrown together and a tabulation of the 1,073 certificates was prepared showing the assignment as made by the United States Bureau of Census and as puerperal or nonpuerperal by each foreign bureau that complied with the request. The proportions assigned to puerperal and nonpuerperal causes in the United States were not significantly different from those for Australia, the Netherlands, New Zealand and Scotland. Italy, Canada, Chile, Czechoslovakia, Northern Ireland, France, Irish Free State, Sweden, Estonia, England and Wales, and Norway assigned significantly more to nonpuerperal and significantly less to puerperal causes than the United States. Denmark was the only country that assigned more of the deaths to puerperal causes than the United States.

The rates for the United States were reclassified on the same basis of assignment of cause as that made in each of the foreign countries. When this was done and a comparison made, the United States rate was still in excess of the official rates of the respective countries with one exception (Scotland). After adjustment of assignment procedures the United States rate exceeded the official rates of five countries (Norway, Sweden, France, Italy and the Netherlands) by at least 100 per cent. The best position which the United

1. New York Academy of Medicine, Hooker, R. S., Director: Maternal Mortality in New York City, New York, the Commonwealth Fund, 1933. Philadelphia County Medical Society, Williams, P. F., Chairman: Maternal Mortality in Philadelphia, Philadelphia County Medical Society, 1934.

2. Tandy, Elizabeth C.: Comparability of Maternal Mortality Rates in the United States and Certain Foreign Countries, Children's Bureau, U. S. Department of Labor Publication 229, 1935.

States could have achieved was fifth from the highest when its rate was determined under the system of Norway and of England and Wales.

As pointed out in the report, the number of death certificates in the group sent abroad was too small to warrant final conclusions regarding the assignment procedure of the countries from which returns were received. The study does indicate, however, an effort to refine and make comparable the maternal mortality statistics of different countries. As pointed out previously, however, only a few of the factors involved are corrected by this comparison.

THE GAPS IN SICKNESS INSURANCE PROPAGANDA

The writings on sickness insurance that have appeared in the United States during the last twenty years are marked by a monotonous sameness. While they purport to be based on scientific analyses and accurate descriptions of existing systems, the sources from which they draw their information lead to this impression of similitude. Practically all the references concern the publications of insurance carriers or reports by government employees in nations having sickness insurance, or to other writers who have used these sources. In every country, at the same time, there has been an almost equally extensive literature, consisting of books and pamphlets by physicians practicing under insurance. The medical journals in these countries contain frequent discussions of the workings of sickness insurance, yet it is hard to find reference to any of these medical writings in any of the books or articles published by propagandists in the United States. They seem to avoid studiously any references to the literature of the opposition.

Advocates of insurance give but slight mention to the characteristics of the medical service furnished under insurance, yet the expressed objective of service systems of insurance is to provide a medical service for the insured.

Discussions of movements in morbidity rates, under insurance, are avoided. Yet again sickness insurance is offered primarily as a means of reducing the suffering from illness. The question is seldom raised in such writings as to whether the actual effect of insurance is to reduce the amount of illness and the consequent suffering and rate of mortality.

A strange silence prevails on the relation of insurance to preventive medicine, although there is much theorizing on the possibility of preventive care under insurance. When the actual works of insurance systems are being discussed, however, there is complete absence of data indicating the extent to which preventive medicine is practiced. For example, advocates of sickness insurance do not discuss the extent of immunization against diphtheria under insurance or the mortality rate from this disease as compared with non-insurance countries. Neither do they speak of the number of periodic health examinations under insurance. They are, in fact, ominously silent on comparisons of the percentage of tuberculous, cancerous or diabetic diseases that are detected at an early stage as contrasted with similar figures in the United States in private practice.

It is useless to search the propaganda of sickness insurance for information on the progress of medical science, medical education and graduate training under insurance systems, nor will any explanation be found of why the nations that led the world in these fields at the time insurance was introduced have been outdistanced, in little more than a generation, by nations in which private practice has been retained.

Although the most important function of medical care and medical science is to extend the period of human life, no exponent of sickness insurance has ever compiled, or at least published, any comparative mortality tables showing the relation of insurance to the duration of human life.

Moreover, the propagandists overlook the fact that, in nearly every country with a system of sickness insurance, numerous critics demand a transformation. In Germany, the home of the oldest sickness insurance system, a movement has been growing for many years to abolish the insurance system in favor of some compulsory saving.

In reciting the history of sickness insurance the propagandists are inclined to suppress the fact that it was introduced in most instances against the opposition of the workers who were to receive the services and at least the sharp criticism of the physicians who were to give the service. In some sections of Germany, England and France, workers' opposition led to almost violent resistance.

Today there are numerous extensive experiments in forms of sickness insurance in the United States. Although the propagandists of sickness insurance claim credit for the introduction of workmen's compensation, which now provides an insurance medical service as large as that of many European systems, little or no reference is made by sickness insurance advocates to the character of the medical service supplied under compensation laws. They seldom quote from legislative and other investigations of that service. They are strangely still on the operations of the "compensation clinics" in New York City or the conditions that have arisen in such states as Washington and West Virginia. They never mention the fact that, wherever medical service under compensation is satisfactory, this result is due to the strenuous efforts of the state medical societies.

These are not mere oversights or casual omissions. They are vital points in the discussion of sickness insurance. Some propagandists avoid them, and thus the propaganda misleads and misinforms the reader.

THE PHYSIOLOGY OF THE PHOSPHOLIPIDS

The fact that the phospholipids are constituents of all living material has given rise to the belief that these substances play some fundamental part in the structural make up and in the vital activity of the cell. Several theories of the physiologic function of the phospholipids have been proposed; however, modern students[1] of the problem appear to endorse only three of these, the metabolic theory, the oxygen transport theory and the structural theory. According to the metabolic theory the phospholipids, particularly the lecithins, are important intermediary products in the metabolism of fats and fatty acids, serving as a means for the transport and oxidation of otherwise water-insoluble, stable fatty acids. Neutral fat from the various depots or from the gastro-intestinal tract is carried to the liver, where desaturation of a portion of the fatty acids occurs and phospholipids are formed. The phospholipids are then transported by the blood to the tissues, where the fatty acids are released and oxidized. Not all of the available evidence, however, supports such a hypothesis. The striking constancy of the phospholipid content of certain organs, even in the face of sudden and extreme changes in metabolism, and the fact that each organ of the body possesses a characteristic phospholipid content which has no apparent relationship to the intensity of fat metabolism, are examples of well established facts that do not fall in line with the metabolic theory. The view is held by some investigators that the phospholipids may be concerned in the transport of oxygen by virtue of the double bond linkages within the molecule, which may act as oxygen accepters as well as potential hydrogen accepters. Although there is some in vitro evidence supporting this hypothesis, such a function of phospholipids has not been demonstrated under physiologic conditions. The third hypothesis, the structural theory, proposes that the phospholipids, because of peculiar physicochemical properties, are important elements in the constitution of protoplasm and in the construction of the membrane enveloping the cell. Experimental evidence in support of this theory is still scanty. Thus, at present definite conclusions regarding the physiologic function of the phospholipids cannot be drawn.

Apparently, phospholipids are readily synthesized by the animal organism. They are present in the bodies of rats, for example, which have been maintained on diets containing only neutral fat as the source of lipid. Also the eggs of ducks or hens fed a ration deficient in phospholipids are known to contain the usual amounts of these substances.

The phospholipid content of different organs is rather characteristic of the organ, within limits, of the species concerned. Brain and liver contain the largest amount, the pancreas, kidneys and muscle containing somewhat less. According to a recent report[2] the phospholipid content of various muscles varies directly with activity and resistance to fatigue. Rabbit heart muscle, for example, contains nearly four times as much phospholipid as the gastrocnemius muscle.

Physiologic factors such as diet, activity, age and certain hormones are known to affect the phospholipid content of tissues, although in general the variations are not large. Fasting appears to decrease muscle phospholipid, to increase liver phospholipid and to have no effect on brain phospholipid. Diets containing relatively large amounts of fat or carbohydrate increase the phospholipid content of the liver and of the blood. Physiologic activity itself affects the phospholipid content of the tissue concerned, an increase in activity eliciting an increase in this substance. The phospholipid content of tissues, particularly of the blood, may show decided changes in certain diseases. Increased blood phospholipid is encountered in diabetes, nephrosis, chronic hemorrhage, Niemann-Pick's disease, epilepsy, hypertension, syphilis, hypothyroidism, liver injury by phosphorus and by chloroform, hydrophobia and B-avitaminosis. Decreases in the phospholipid content of the blood are usually found in infectious fevers, cancer, epilepsy and pernicious anemia. In contrast to the content in the blood in diabetes, the phospholipid content of portions of the femoral nerves of diabetic patients, according to recent analyses,[3] is much lower than that of similar specimens from normal subjects. Furthermore, as the clinical signs of neuropathy progressed the degree of lipid deficiency increased. The relation appears to be quite the opposite in cases of cancer, the blood phospholipid being less than normal whereas the phospholipid content of the malignant tumor is high. The elucidation of the significance of these interesting observations may well yield information of value not only in determining the nature of the changes occurring in these diseases but also in the ultimate solution of the important question of the physiologic function of the phospholipids.

1. Sinclair, R. G.: The Physiology of the Phospholipids, Physiol. Rev. **14**: 351 (July) 1934.

2. Bloor, W. R., and Snider, R. H.: Phospholipid Content and Activity in Muscle, J. Biol. Chem. **107**: 459 (Nov.) 1934.

3. Jordan, W. R.; Randall, L. O., and Bloor, W. R.: Neuropathy in Diabetes Mellitus: Lipid Constituents of the Nerves Correlated with Clinical Data, Arch. Int. Med. **55**: 26 (Jan.) 1935.

Current Comment

COD LIVER OIL

Cod liver oil has long held a prominent place among therapeutic agents. Despite studies that have revealed the enormously greater antirachitic potency of viosterol as gaged by the conventional bio-assay methods, cod liver oil is still highly regarded. There is evidence that, based on units of vitamin D as determined by assay on rats, cod liver oil is superior to viosterol in the cure and prevention of rickets in human infants. There has accumulated a considerable mass of experimental proof

that leg weakness in chickens is far more susceptible to cure and prevention by cod liver oil than by viosterol in oil in amounts of each equally efficacious in the cure of rickets in rats. Despite the fact that nearly all fish oils contain vitamin D, perhaps the most striking support for the peculiar efficacy of cod liver oil has been recently brought forward by Bills, Massengale and Imboden,[1] who found that blue fin tuna liver oil with 40,000 units of vitamin D per gram was only one sixth as effective when assayed with chicks as was cod liver oil with only 100 units of vitamin D per gram. These and other observations have suggested that there are several forms of vitamin D. However, apart from the vitamin content, cod liver oil has other chemical attributes, as has been emphasized by Holmes and Remington.[2] These investigators have shown that American cod liver oil contains more iodine than do most ordinary foods (calculated to the dry basis). The content of iodine varies with the place where the fish are caught, the average of the values being nearly 9 parts per million. It is further pointed out that, accepting the daily iodine requirement for man as between 50 and 100 micrograms, 10 cc. of high grade medicinal cod liver oil would, if thoroughly assimilated, contribute to the daily iodine requirement. From this analysis it is not to be concluded that cod liver oil should be administered for its iodine content.

CONTINUOUS CAMPAIGN FOR IMMUNIZATION AGAINST DIPHTHERIA NECESSARY

A movement of interest to physicians will be announced during the month of April by the May Day Committee of the State and Provincial Health Authorities of North America, together with the American Child Health Association, as the May Day-Child Health Day Project for 1935. A determined effort will be launched to promote diphtheria immunization. According to notifications sent to national health organizations and to the press, the objective was chosen because there has been no reduction since 1930 in the number of deaths from diphtheria throughout the United States. Some states have accomplished a notable reduction in the number of deaths; therefore it must follow that others have suffered increases. This means that diphtheria immunization in the United States has not been uniformly and consistently applied. The committee announces its belief that immunization should be the work of the private physician. State health officers will be asked to send a communication to each physician in the state urging (1) that he remind his patients who have children under school age of the need for immunization, (2) that he ask his patients to bring their children to be immunized, and (3) that he make it a routine of his practice in the future to immunize during the first year of life all babies under his care. The medical profession, which has never been enthusiastic about sporadic health drives, may well support this effort, which uses May Day merely as a taking off place and a means of attracting the attention of the public. The objective of the plan is to immunize all children between the ages of 6 months and 6 years and to maintain this as a continuing service. It is hoped that cooperation will be developed in the states between the departments of public health and the medical profession, since both agencies are necessary for the success of any community plan for diphtheria control. The Board of Trustees of the American Medical Association, on request of the American Child Health Association, urges physicians to assist and cooperate in this plan.

1. Bills, C. E.; Massengale, O. N., and Imboden, Miriam: Science **80**: 596 (Dec. 21) 1934.
2. Holmes, A. D., and Remington, R. E.: Iodine Content of American Cod Liver Oil, Am. J. Dis. Child. **49**: 94 (Jan.) 1935.

Medical Economics

MEDICAL CARE OF THE INDIGENT IN THE DISTRICT OF COLUMBIA

The Medical Society of the District of Columbia, June 2, 1934, adopted a set of principles indicating policies to be pursued in any plan for providing medical care for the indigent sick. This statement has been forwarded to all agencies concerned with the furnishing of such medical care and is to form the basis of future actions by that society.

As examples of previous and present cooperation in general health activities, the statement instances the work of the medical society in health education, tuberculosis care, restricting the practice of medicine by hospitals, and guiding the movement for group hospitalization so as to safeguard against any harmful features. At the present time the society is studying, through appropriate committees, methods of setting up an agency to secure medical service by affording an opportunity to budget the cost of medical care. It is also working on a plan to safeguard the right of an employee under workmen's compensation to be treated by a physician of his own choice.

Those needing medical care may be divided into three groups:

(*a*) Those able to pay for such care out of their own resources.

(*b*) Those who might be able to pay for care themselves if means should be provided to spread the payment over a sufficient length of time.

(*c*) The group whose members are without resources to meet the needs of medical care.

Special provisions are required for only the last two groups. The first step is to insure that funds available are used economically and appropriately for the benefit of the truly indigent. The executive committee of the Community Chest has established a central admitting bureau, which is endorsed by the medical society as an effective and forward step in preventing the abuse of medical charity.

In considering the problem of the indigent, it is noted that the physicians of the United States contribute to the sick poor services valued at a million dollars daily. The present government contribution for this purpose is largely represented by ten physicians to the poor at a salary of $1 a day, less 10 per cent. It is obvious that such a plan leaves medical care of the indigent almost entirely to the charity of the local profession.

This is a situation in which any agency planning medical care for the indigent is preparing to give away medical services which it does not possess and for which it does not, and apparently cannot, pay. Until such time as such agencies are in a position to pay for the services of physicians at mutually agreeable rates, the medical profession is entitled to determine the conditions under which it is willing to furnish medical care to the indigent.

"The medical society, therefore, as one of the representative organizations of the local profession, by the adoption of this resolution and statement, gives notice that any commitments for the disposal of free medical services arrived at by individuals, groups, committees or any agencies, official or unofficial, to whose deliberations it has not been a party, are without binding effect upon it or its members and, in any event, remain entirely subject to its approval or disapproval."

The only object of the medical society in making this statement is to promote an accord between all the agencies responsible for furnishing medical care to the indigent and to secure cooperation and understanding rather than friction and discord in order that no deserving individual in need of care shall go without it.

Association News

MEDICAL BROADCASTS

Columbia Broadcasting System

The American Medical Association broadcasts on a western network of the Columbia Broadcasting System each Thursday afternoon on the Educational Forum from 4:30 to 4:45, central standard time. The next three broadcasts will be delivered by Dr. W. W. Bauer. The titles will be as follows:

March 21. Rickets.
March 28. This Is No April Fool.
April 4. Negro Health Week.

National Broadcasting Company

The American Medical Association broadcasts under the title "Your Health" on a Blue network of the National Broadcasting Company each Tuesday afternoon from 4 to 4:15, central standard time. The next three broadcasts will be as follows:

March 19. White Collar Hazards, W. W. Bauer, M.D.
March 26. Tonics and Sedatives, Morris Fishbein, M.D.
April 2. Sickness Insurance, R. G. Leland, M.D.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ARIZONA

Bill Introduced.—S. 167, to amend the medical practice act, proposes (1) to eliminate the provision that of the members of the board of medical examiners two shall be allopaths, one homeopath, one eclectic and one osteopath by requiring four members of the board to be graduates of schools recognized by the American Association of Medical Colleges and one member to be a graduate of a recognized school of osteopathy; (2) to provide staggered six year terms for members of the board; (3) to make it a felony for any one to practice or attempt to practice without being licensed; and (4) to require licensed physicians and osteopaths to register annually on or before the first day of January with the secretary of the board and at that time to pay a fee of $3.

ARKANSAS

Bills Introduced.—S. 442, to amend the medical practice act, proposes to authorize the boards of medical examiners to license without examination applicants who are diplomates of the National Board of Medical Examiners. H. 486, to amend the osteopathic practice act, proposes to prohibit osteopaths from performing major surgical operations but to permit them to practice osteopathy in all the subjects or branches on which they were examined when they applied for licenses. The bill further proposes to permit osteopaths to make and sign birth certificates, death certificates, and/or all other certificates pertaining to public health.

COLORADO

Personal.—Dr. Charles J. Kaufman, formerly of New York, was recently appointed medical director of the National Jewish Hospital, Denver, and assistant professor of medicine at the University of Colorado School of Medicine.

Society News.—The Boulder County Medical Society was addressed in Boulder, February 14, by Drs. Robert K. Dixon and Louis S. Faust, Denver, on "Diagnosis and Management of Upper Abdominal Complaints," and "Diarrhea in Adults," respectively.——A symposium on cancer of the gastro-intestinal tract was presented before the Northeast Colorado Medical Society in Sterling, January 10, by Drs. Kenneth D. A. Allen, Constantine F. Kemper, George B. Kent and George Z. Williams, all members of the cancer team of the state medical society.——Dr. William Senger, Pueblo, addressed the Pueblo County Medical Society, January 22, on "Tumors of the Breast."

Bills Passed.—The following bills have passed the house and the senate: H. 138, proposing to repeal the laws regulating the sale, distribution or possession of narcotic drugs and to enact what appears to be the uniform narcotic drug act; and H. 557, proposing to prohibit the retail sale or distribution of barbital or other hypnotic or somnifacient drugs except on the prescription of a duly licensed physician, dentist or veterinarian. S. 228 has passed the senate, proposing to make it the duty of any physician, nurse or midwife, assisting in or in charge of the birth of any infant or having its care after birth, to treat its eyes as soon as possible after birth with a prophylaxis approved by the state board of health.

CONNECTICUT

Dr. Greenburg Appointed Health Officer.—Dr. Leonard Greenburg, acting health officer of New Haven, has been placed in full charge of the department of health. He succeeds Dr. John L. Rice, who left New Haven to become health officer of New York City. Dr. Greenburg, assistant clinical professor of public health at Yale University School of Medicine, succeeded Dr. Herbert R. Edwards as acting health officer when the latter resigned to direct the tuberculosis program in New York under Dr. Rice. In 1923 Dr. Greenburg received the degree of doctor of philosophy from Yale University and in 1930 the degree of doctor of medicine. He was a member of the staff of the U. S. Public Health Service from 1918 to 1922.

DELAWARE

Bill Introduced.—S. 155 proposes to prohibit any child from attending either a public or a private school unless it has been successfully vaccinated against smallpox or produces a certificate from a practicing physician that vaccination is inadvisable by reason of some physical disability.

Society News.—Dr. Joseph B. Wolffe, associate professor in medicine and director of the cardiovascular department, Temple University School of Medicine, Philadelphia, addressed the New Castle County Medical Society, February 19, Wilmington, on "New Concepts in the Treatment of Angina Pectoris and Intermittent Claudication."

DISTRICT OF COLUMBIA

Medical Bills in Congress.—S. 2153, introduced by Senator Copeland, New York, proposes to provide for the prevention of blindness in infants born in the District of Columbia.

Graduate Clinic.—The third annual graduate clinic of George Washington University School of Medicine, Washington, was held, February 23. Sessions were held at the Garfield Memorial Hospital and the school of medicine. The following subjects were presented:

Uterine Cervical Stump Pathology, Dr. Henry L. Darner, associate in obstetrics and gynecology.
Head Injuries, Dr. Harry H. Kerr, clinical professor of surgery.
Some Unusual Nephropathies, Dr. Henry C. Macatee, clinical professor of pediatrics.
Cancer of the Prostate, Dr. Francis R. Hagner, professor of urology.
Management of Unusual Fractures of the Femur, Dr. Custis L. Hall, assistant professor of surgery.
Cystoscopic Demonstrations, Drs. Homer G. Fuller, clinical professor of urology, Alan J. Chenery, associate in urology, and Charles P. Howze, associate in urology.
The Routine Treatment of Gonorrhea in Women (The Nonantiseptic Method), Dr. Bernard Notes, clinical instructor in obstetrics and gynecology.
Methods of Immunization Against Poliomyelitis, Dr. Earl B. McKinley, dean of the medical school.
Surgical Edema, Dr. Charles S. White, professor of surgery.
Endocrinology in the Treatment of Functional Disorders of the Female, Dr. Jacob Kotz, clinical professor of obstetrics and gynecology.

In the afternoon the guests inspected the laboratories and demonstrations at the school of medicine.

Society News.—At a joint meeting of the ophthalmologic and otolaryngologic sections of the Baltimore City Medical Society with the Medical Society of the District of Columbia, February 15, in Washington, speakers were Drs. William H. Wilmer on "Pits or Holes in the Optic Disk"; Walter A. Wells, "Something About the External Nose"; Oscar Wilkinson, "Treatment of Ocular Injuries," and Frederick C. Schreiber, "Septic Meningitis." Dr. Douglas Quick, New York, addressed the district society, March 13, on "Treatment of Cancer of the Breast."——The George M. Kober Medical Society was addressed, January 21, by Dr. Russell J. Fields on "Incidence of Syphilis in Washington," and Otto

Wendt, D.D.S., "Retention of Teeth Following Fracture."——Speakers before the Osler Medical Society, January 21, were Drs. Eugene Clarence Rice Jr., on "Meningitis in Children," and James M. Fadeley, "Urethral Calculus."

FLORIDA

Personal.—Dr. William J. Lancaster, Tampa, has been appointed superintendent and medical director of the Atlantic Coast Line Railroad. He took over his new position, January 1, with headquarters at Wilmington, N. C. The Hillsborough County Medical Society gave a dinner in honor of Dr. Lancaster, January 3, and presented him with an engraved watch.——Dr. and Mrs. Thomas S. Anderson, Live Oak, celebrated their golden wedding anniversary, Dec. 17, 1934.——Louva G. Lennert, chief engineer of the state board of health since 1932, has been named assistant state director of malaria control and sanitation. Mr. Lennert has served with the board of health of Texas and California, the Rockefeller Foundation, and the public health service in Texas and Louisiana, newspapers reported.

GEORGIA

Society News.—Dr. Jack C. Norris, Atlanta, presented a paper on "The Pathology of Agranulocytosis—A Survey of Seventy-Three Cases" before the Fulton County Medical Society, February 7. Dr. Emmett D. Highsmith, Atlanta, presented a paper on "The Possibilities of Plastic Surgery" before the society, February 21.——The Fulton County Medical Relief Association recently changed its name to the Atlanta Medical Service Bureau.——Speakers before the Fourth District Medical Society in Griffin, February 6, included Drs. Charles E. Irwin, Warm Springs, on "After-Care of Poliomyelitis"; George L. Walker, "Practical Management of Congestive Heart Failure"; James E. Paullin, "Medical Economics," and Allen H. Bunce, "Transfusion in the Treatment of Infectious Arthritis," all from Atlanta.——Dr. Job C. Patterson, Cuthbert, read a paper on "Duodenal Stasis" before the Randolph County Medical Society in Cuthbert, February 7.——Dr. Hyland F. Bent, Midville, discussed "Uterine Hemorrhage at the Menopause" before the Burke-Jenkins-Screven Counties Medical Society at Millen, February 7.

Bills Introduced.—H. 752, to amend the chiropractic practice act, proposes to require chiropractors to register annually on or before April 1 with the joint secretary of the examining boards and at that time to pay a fee of $5. Failure on the part of a chiropractor to register annually is automatically to revoke his license. S. 197 proposes to permit any hospital not solely maintained by public funds, which is approved by the American Medical Association, the American Hospital Association, the American College of Surgeons, the Medical Association of Georgia, or the Georgia Hospital Association, to enter into contracts to provide hospitalization in consideration of a stipulated amount of money to be collected weekly, monthly or yearly in advance. Substitute for H. 365 proposes to prohibit the retail sale or distribution of barbituric acid, amytal, allonal, luminal, veronal or sodium amytal except on the prescription of a licensed physician, dentist or veterinarian. H. 695 proposes to make it unlawful for any person other than a registered pharmacist to sell or offer for sale any prophylactic, contraceptive or chemical or mechanical instrumentality or agency for the prevention of conception or of venereal diseases.

ILLINOIS

Bills Introduced.—H. 411 and S. 210 propose to impose on physicians, osteopaths, dentists, chiropractors, chiropodists and optometrists an annual occupational tax equal to 3 per cent of their gross receipts from practice. H. 425, to amend the medical practice act, proposes to permit corporations to practice medicine.

Chicago

Hospital News.—A new $500,000 addition to the U. S. Marine Hospital, Chicago, was dedicated, February 18, with Surg. Gen. Hugh S. Cumming presiding at the ceremonies. The new wing, which contains 109 beds, increases the institution's capacity to 264 beds. The hospital was founded in 1873.

Course in Tumor Pathology.—It is announced that the membership quota for the course in tumor pathology that is being given at the Cook County Graduate School of Medicine has been reached, and no further applications will be accepted. The course, which is under the direction of Dr. Richard H. Jaffe, will be repeated in the fall.

Focal Infections.—"The Present Concept of Focal Infection" will be discussed by Drs. Isidor Pilot and Joseph L. Miller before a joint meeting of the Chicago Medical Society and the Chicago Society for the Study of Rheumatic Diseases, March 20. Dr. Edward H. Ochsner will present a paper on "The Value of Colloidal Gold in Inoperable Cancer."

Reference Bureau.—The Chicago Medical Society has placed in operation a reference bureau for the public. General practitioners and specialists are classified and indexed according to the branch society of which they are members. Physicians belonging to the bureau will be called in rotation. Formerly when calls for a physician came to the society they were denied, but now under the new service an inquirer will be referred to a physician in his own residential district. No charge will be made for the service, only the attending physician receiving a fee.

Society News.—The Chicago Orthopedic Society was addressed, March 8, by Drs. Max Cutler on "Treatment of Bone Tumors" and Charles W. Peabody, Detroit, "Tendon Transplants Judged by Late Results."——At a meeting of the Chicago Urological Society, February 28, Drs. Tyrrell G. McDougal and Julius M. Glasser discussed "Conservative Treatment of Hydronephrosis" and "Calculi Formation Following Prostatectomy," respectively.——Speakers before the Chicago Council of Medical Women, March 1, were Drs. Ethel M. Davis, "Rheumatic Endocarditis in Children," and Alice K. Hall, "Popular Fallacies in Otolaryngology."——Among others, Dr. Owen H. Wangensteen, Minneapolis, addressed the Chicago Surgical Society, March 1, on "Practical Aspects of the Therapeutic Problems in Bowel Obstruction."——The Chicago Laryngological and Otological Society was addressed, March 4, by Dr. William F. Petersen, on "Meteorological Factors in Otolaryngologic Practice."

INDIANA

Reciprocity with New York.—Reciprocity relations for licenses to practice medicine have been established between Indiana and New York, according to the *Journal of the Indiana State Medical Association.*

Society News.—Dr. George Gilbert Smith, Boston, spoke before the Indianapolis Medical Society, February 19, on "Renal Infections"; he also conducted a clinic. A symposium on coronary disease was presented before the society, February 26, by Drs. George S. Bond, Robert M. Moore and Cyrus J. Clark, Indianapolis.——Speakers before the Northeastern Indiana Academy of Medicine at Kendallville, February 21, were Drs. John W. Thomson, Garrett, and Abraham J. Sparks, Fort Wayne, on "Rupture of the Liver" and "Transurethral Prostatectomy," respectively.

Bill Introduced.—S. 229 proposes to create an independent board of chiropractic examiners and to regulate the practice of chiropractic. "Chiropractic," states the bill, "is a Philosophy, Science and Art of things natural; a system of locating and removing interference with nerve transmission and expression and its effects by adjustment of the articulations of the spinal column and adjacent tissues for the correction of the cause of disease and includes physical, hygienic and sanitary measures incident thereto. A license to practice Chiropractic . . . shall not confer upon the licensee the right to prescribe drugs, practice surgery or obstetrics, or to administer anaesthetics."

IOWA

Baker Loses by Default.—Norman Baker did not appear at a hearing before the Federal Communications Commission at Washington, D. C., February 14, and his application for a permit to open a new broadcasting station in Muscatine was denied. Baker formerly operated Station KTNT at Muscatine, but his permit was canceled because of charges made by the Muscatine County Medical Society. These charges were based on his radio preachments against health measures and all rational treatment of disease, and his insulting accusations against the medical profession. Following his trial, Baker established Station XENT in Nuevo Laredo, Mexico. This station was still operating, February 15.

KANSAS

Bill Introduced.—S. 454 proposes to exempt from the provisions of the state insurance laws "church hospitals which have been in operation ten years or more."

Immunization Campaign.—Seventy-seven school districts were visited and 1,400 children were immunized in a campaign against diphtheria recently conducted by the Brown County Medical Society under the auspices of the state board of health. Blanks were sent to parents, and newspapers cooperated in urging all to take advantage of the plan. Completed blanks were plotted on a map according to school districts; an attempt

was made to divide applicants evenly among physicians, and central points were selected for twelve districts with each physician as far as possible in charge of a district within his locality. Toxoid was furnished without cost by the state board of health.

MAINE

Society News.—Dr. Carl W. Ruhlin addressed the Portland Medical Club, January 2, on "Orthopedic Aspect of Arthritis." Dr. Harold V. Bickmore discussed diseases of the gallbladder before the club recently.——A paper on tachycardia was presented before the York County Medical Society in Kennebunk, January 9, by Dr. Eugene H. Drake, Portland.

MARYLAND

Bill Passed.—S. 211 has passed the senate, proposing to authorize corporations to organize under the corporation laws of the state for the purpose of operating a nonprofit hospital service plan.

Bill Introduced.—H. 321 proposes to authorize the sexual sterilization of any inmate of a state institution whenever the superintendent or managing director of the institution is of the opinion that "it is for the best interest of the patients and of society" that he be sexually sterilized.

Anniversary Meeting.—The Mental Hygiene Society of Maryland observed its twentieth anniversary at a dinner meeting, February 14. The twenty-fifth anniversary of the mental hygiene movement was also commemorated by the society on this occasion, as it has been by several societies throughout the country in the past several months. The national organization held its celebration, Nov. 14, 1934, in New York. Guest speakers on the Baltimore program included Mr. Clifford W. Beers, founder of the national movement, and Dr. Clarence M. Hincks, general director of the National Committee for Mental Hygiene, both of New York.

MASSACHUSETTS

Shattuck Lecture.—Dr. William E. Gallie, professor of surgery, University of Toronto Faculty of Medicine, Toronto, Canada, will deliver the Shattuck Lecture at the annual meeting of the Massachusetts Medical Society, June 3, on "Sprains and Dislocations."

Lectures on Mental Hygiene.—The state division of university extension and the Massachusetts Society for Mental Hygiene are sponsoring a course of eight lectures on "The Mental Hygiene of Adolescence" at the Calvin Coolidge School, Melrose. The following speakers are participating in the series, which began February 6: Dr. Clarence A. Bonner, superintendent of the Danvers State Hospital, Hathorne, Dr. Henry B. Elkind, medical director, Massachusetts Society for Mental Hygiene, and Miss Bernice M. Henderson.

Society News.—Dr. John A. Hartwell, New York, spoke before the Harvard Medical Society, February 26, in Boston; his subject was "Your Profession and Society."——Dr. James W. White, New York, presented a paper before the New England Ophthalmological Society in Boston, February 19, on "Diagnosis and Treatment of Vertical Strabismus."——At a meeting of the New England Physical Therapy Society, February 20, Dr. Frederick W. O'Brien, Boston, discussed "The Present Status of Radium and X-Rays in the Treatment of Malignant Disease."——Speakers before the Massachusetts Psychiatric Society in Boston, February 27, were Drs. Salomon Gagnon, Danvers, on "Review of the Problems of Bacillary Dysentery"; Leo Maletz, Danvers, "Sodium Fluoride Poisoning," and Paul E. Tivnan, Salem, "Paget's Disease."——Dr. Herbert L. C. Johnson, Boston, discussed "The Use of Amniotic Fluid in Abdominal Surgery" before the Norfolk District Medical Society, February 26.

MICHIGAN

Dr. Stoddard Celebrates One Hundredth Birthday.—Dr. John Parker Stoddard, Muskegon, was entertained at dinner by the Muskegon County Medical Society, February 22, in celebration of his one hundredth birthday. Dr. Stoddard is the oldest living alumnus of the University of Michigan and is said to be the oldest living graduate of Bellevue Hospital Medical College. Speakers included representatives of the University of Michigan and Albion College. Dr. Stoddard received a congratulatory telegram from President Roosevelt. About 200 persons attended the dinner. Dr. Harold F. Closz, president of the medical society, presided.

Society News.—Dr. William D. Fullerton, Cleveland, addressed the Wayne County Medical Society and the Detroit Obstetrical and Gynecological Society, February 4, on "Carcinoma of the Uterus, Its Early Diagnosis and Treatment."——The Detroit branch of the American Urological Association presented a symposium on hematuria before the Wayne County Medical Society, January 21; speakers, all from Detroit, were Drs. Robert A. MacArthur, George C. Burr, Robert M. Cothran, Edward George Olsen, Harold L. Morris and Charles Stuart Wilson.——The Oakland County Medical Society met at the Oakland County Tuberculosis Sanatorium, Pontiac, February 20; a clinical demonstration in epidemiology constituted the afternoon program, and Dr. George A. Sherman and the staff discussed "Factors in Diagnosis and Treatment of Tuberculosis" in the evening.——Dr. George W. Hall, Chicago, discussed the "Newer Things in Neurology" before the Calhoun County Medical Society, February 5.

MINNESOTA

Society News.—At a meeting of the Minneapolis Surgical Society, February 7, Dr. Emil Goetsch, Brooklyn, spoke on "Criteria of Operability for Thyroidectomy."

Bills Introduced.—H. 579 proposes to amend the law relating to the care, treatment and hospitalization of indigents by permitting the county board of any county in which there is located a hospital designated as a class A hospital by the American College of Surgeons to contract with such hospital to care for and treat indigent residents of the county. H. 865 proposes to prohibit the employment of public school teachers, clerks or janitors unless they present certificates from licensed physicians that they are free from tuberculosis in an active form. S. 671 proposes to prohibit any public health nurse, public school nurse or employee of a public school or public school board from using his position (1) to promote the business of any particular physician or other practitioner of the healing art or (2) in discrimination for or against any particular school of the healing art.

MISSOURI

Personal.—Dr. James R. Bunch has been appointed acting superintendent of state hospital number 2, St. Joseph.——Dr. John O'Connell, Overland, was presented with a loving cup by the St. Louis County Medical Society on his retirement as president, January 9.——Dr. Fred W. Bailey, St. Louis, has been appointed a member of the Missouri State Board of Health to succeed Dr. Emmett P. North, St. Louis.——Dr. Hyman I. Spector, St. Louis, tuberculosis controller of St. Louis, has been named assistant health commissioner, and Dr. James L. Mudd has been appointed to succeed him in the former office.——Dr. Edwin L. Sheahan, Clayton, has been appointed superintendent of the St. Louis County Hospital, Clayton.

MONTANA

Bill Enacted.—H. 66 has become a law, requiring both parties to a prospective marriage as a condition precedent to their right to receive a license to wed, to present a physician's certificate that they are free from venereal disease and from tuberculosis in an infectious stage, and that neither of them has been adjudged in a court of competent jurisdiction to be an idiot, an imbecile or of unsound mind.

NEBRASKA

Society News.—Speakers at a meeting of the Southwestern Nebraska Medical Society, McCook, January 10, were the following Lincoln physicians: Drs. Earl V. Wiedman, on acute conditions in the abdomen in children; Roy H. Whitham, peritonitis, and Miles J. Breuer, treatment of arthritis.——Dr. Nymphus F. Hicken, Omaha, discussed goiter before the Otoe County Medical Society, Nebraska City, January 7.——Drs. George E. Robertson and Leon S. McGoogan, Omaha, addressed the Madison-Six Counties Medical Society, Norfolk, January 22, on vitamins and minerals in pregnancy.

NEW HAMPSHIRE

Meeting on Economic Problems.—A special meeting of physicians, state officials and members of the legislature, sponsored by the New Hampshire Medical Society, was held in Concord, Dec. 13, 1934, to discuss administration of medical relief and sickness insurance. A report on sickness and hospital insurance was presented by Dr. Carleton R. Metcalf, Concord, secretary of the state society, and James A. Hamilton, Hanover, chairman of the State Hospital Superintendents' Club.

NEW YORK

Personal. — Dr. John A. Carswell, Scarsdale, tuberculosis clinician on the staff of the Westchester County department of health, has been provisionally appointed to the staff of the division of tuberculosis in the state department of health, Albany. He has been stationed at the New York State Hospital for Incipient Tuberculosis, Ray Brook, to organize a chest clinic service in the Adirondack district as an outpatient activity. The area to be served includes Franklin, Clinton, Essex and Hamilton counties.——Albert F. Blakeslee, D.Sc., acting director of the department of genetics of the Carnegie Institution of Washington at Cold Spring Harbor, has been made a corresponding member of the Academy of Sciences of the Institute of France, *Science* reports.

Bills Introduced.—S. 1414 and A. 1861, to amend the laws relating to the practice of chiropody, propose to designate the practice of chiropody as the practice of podiatry and to create an independent board of podiatry examiners. Under the present law, apparently, chiropodists are licensed by the board of medical examiners. A. 1883, to supplement the workmen's compensation act, proposes to make compensable any disease of the lungs or respiratory tract resulting from the inhalation of dust in any form of (1) mining, quarrying and/or dressing of stone, (2) manufacture of refractory materials and abrasives, (3) rock-drilling, sand and/or steel grit blasting, (4) porcelain-enameling, (5) metal grinding and/or polishing, (6) lens grinding and/or polishing, (7) pottery manufacture, (8) glass-making, (9) foundry work, or (10) any occupation involving the preparation or manufacture of asbestos or of articles containing asbestos. A. 1863 proposes to prohibit any experiment or investigation to be made on a living dog.

New York City

Sixth Harvey Lecture.—The sixth of the present series of lectures presented by the Harvey Society will be given by Dr. Gleb V. Anrep, professor of physiology, Egyptian University Faculty of Medicine, Cairo, at the New York Academy of Medicine, March 21. His subject will be "The Relation of the Circulation in Voluntary and Plain Muscle to Activity."

Skin and Cancer Unit Opened. — Consolidation of the Stuyvesant Square Hospital with New York Post-Graduate Medical School and Hospital was effected with the opening, January 21, of a new skin and cancer unit representing the combined outpatient services of the departments of dermatology and syphilology of the affiliated institutions. The building of the Stuyvesant Square Hospital, formerly known as the New York Skin and Cancer Hospital, has been completely remodeled for the outpatient service, all bed patients having been transferred to the Post-Graduate Hospital. It has its own administrative offices, social service, pharmacy, laboratories, physical therapy equipment and other facilities. Approximately 1,200 mg. of radium owned by the unit has been transferred to the department of radiology of Post-Graduate Hospital, radium work in the new clinic being limited to cancer and other lesions of the skin. Dr. George Miller MacKee, professor of dermatology and syphilology, Columbia University College of Physicians and Surgeons, and head of the department of dermatology at New York Post-Graduate Medical School, is director of the new clinic. Dr. Carl Eggers is in charge of cancer surgery in the new unit and has been appointed professor of clinical surgery at Columbia. Chiefs of clinics are Drs. Charles Mallory Williams, Isadore Rosen, John Frank Fraser and Fred Wise.

NORTH CAROLINA

Physicians in Legislature.—Three physicians are serving in the present state legislature: Dr. John T. Burrus, High Point, is chairman of the senate committee on health; Dr. Ranson L. Carr, Rosehill, chairman of the house of representatives committee on health, and Dr. Charles A. Peterson, Spruce Pine, member of the house committee.

Bills Introduced.—S. 231 proposes to exempt from taxation all general hospitals operating approved training schools for nurses. S. 258, to amend the laws authorizing the sexual sterilization of certain socially inadequate persons, whether inmates of state institutions or not, proposes that the sterilization operation authorized by the law shall be vasectomy in the case of males and salpingectomy in the case of females, or any medical or surgical method of sterilization which does not include the removal of any sound organ of the body. H. 539 proposes to repeal the law requiring a male applicant for a marriage license either to sign an affidavit that he is free from venereal disease and active tuberculosis or to present a certificate from a licensed physician to that effect.

OHIO

Personal.—Dr. Milton R. Kukuk, Toledo, has been appointed health commissioner of Lucas County to succeed the late Dr. Fred F. Devore.——Dr. Richard S. Austin was recently elected president of the Public Health Federation of Cincinnati.——Dr. Clarence E. Northrup, McConnelsville, has been appointed health officer of Morgan County, succeeding Dr. Arnold O. Abraham, who removed to Niles, Mich.——Dr. Harry G. Southard, Marysville, retiring state health officer, has been appointed a member of the state public health council, succeeding the late Dr. Charles O. Probst.——Dr. William H. Hawley, College Corner, was guest of honor at a dinner given by members of the Union Medical Association, January 10, in celebration of his fiftieth anniversary in the practice of medicine, at the Hotel Anthony Wayne, Hamilton. Dr. William L. Porter, College Corner, was toastmaster.——Dr. Wade MacMillan, for seventeen years medical director at Miami University, Oxford, has announced his retirement, effective at the end of the year.

Bills Introduced.—S. 137, to amend the medical practice act, proposes to require an applicant for a license to practice medicine to have received prior to his admission to medical school either a degree from a reputable college or to have completed satisfactorily at least two full college years in an approved college in premedical subjects. S. 145 proposes to create an independent board of chiropractic examiners and to regulate the practice of chiropractic. Chiropractic is defined as "the art and science of locating and the procedure preparatory to adjusting by hand of the subluxations of the articulations of the human spinal column, which is deemed to be the twenty-four movable vertebrae, including the sacrum and coccyx, and adjacent tissues, for the purpose of removing any interference with nerve transmission; but it shall not include major surgery, nor the administration or prescription of any drug or medicine included in materia medica." H. 221 proposes that the provisions of the medical practice act shall not apply "to any persons who in the practice of the religious tenets of their church confine their ministrations to the sick or afflicted to prayer and spiritual means, and without the use of material medicine or material means or manipulations."

OKLAHOMA

Bill Introduced.—S. 62 proposes to accord to physicians, nurses and hospitals, treating persons injured through the negligence of others, liens on all rights of action, claims, judgments, compromises or settlements accruing to the injured persons by reason of their injuries.

New State Health Officer.—Dr. Charles M. Pearce, health officer of McAlester, has been appointed state health officer to succeed Dr. George N. Bilby. Dr. Pearce is a native of Alabama and a graduate of Birmingham Medical College, 1915. He was one of four candidates for the position recommended by the Oklahoma State Medical Association, newspapers reported.

OREGON

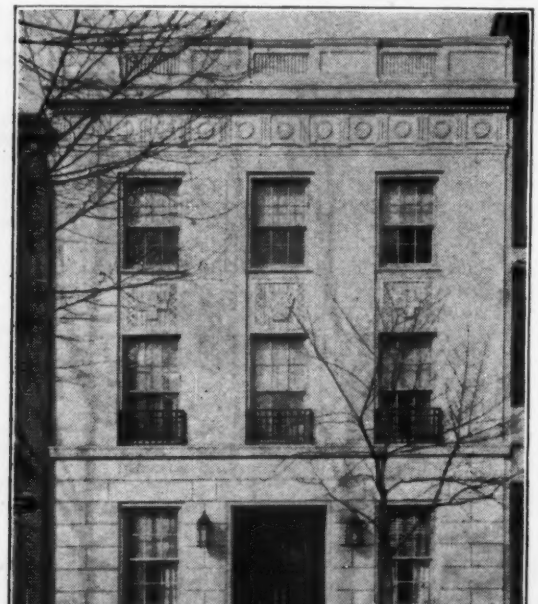
Bills Enacted.—The following bills have become laws: H. 180, limiting the distribution of appliances, drugs and medicinal preparations intended or having special utility for the prevention of conception and/or venereal diseases, to licensed physicians and to persons licensed to do so by the state board of pharmacy; H. 107, repealing the laws regulating the possession and distribution of narcotic drugs and enacting a bill which, although denominated as the "uniform narcotic drug act," deviates from the model act in that it omits provisions intended to limit the gross quantity of a habit-forming drug a person can buy in exempt preparations within a period of forty-eight hours; H. 208, prohibiting the distribution of amytal, luminal, veronal, barbital, acid diethylbarbituric, or any preparation or compound containing any of the foregoing substances, except on the prescription of a licensed physician, dentist or veterinary surgeon.

PENNSYLVANIA

Bills Introduced.—S. 393, to supplement the workmen's compensation act, proposes to permit the department of labor and industry, the employer, or the claimant to require an autopsy on the body of a workman dying following industrial injuries. H. 1136, to amend the medical practice act, proposes to authorize the bureau of medical education and licensure to revoke or suspend the license of any practitioner who has acted as "an adjuster of claim or claims arising out of personal injuries" or who has negotiated for "the settlement of such claim or claims where such claims do not involve injuries to himself or his or her family." S. 417 proposes to create a board of naturopathic education and licensure and to regulate the

practice of naturopathy, which the bill defines as "a philosophy of healing embodying within itself a complete system of therapeutics, basing its treatment of all physiological dysfunctions and abnormal conditions of the body on the Natural Laws governing the body and maintaining life. This system includes the correlation of part with part anatomically, physiologically, psychologically and chemically and does not use drugs or surgery in any manner or form." H. 1081 proposes to authorize a licensed optometrist to issue any certificate of ocular or visual efficiency required by any law.

State Society Dedicates New Headquarters.—A new building for the headquarters and offices of the Medical Society of the State of Pennsylvania was recently dedicated in Harrisburg. Dr. Edgar S. Buyers, Norristown, chairman of the board of trustees, presided. Mr. Edwin Greene, representing the architects, presented the keys to Dr. Augustus S. Kech, Altoona, chairman of the building committee, who told the history of the movement that culminated in the remodeling of a building bought in 1923. Dr. Kech in turn presented the building and Dr. Moses Behrend, Philadelphia, president, accepted it for the state society. The front of the three story



New Home of the Medical Society of the State of Pennsylvania.

building has been reconstructed of Indiana limestone to conform with public buildings of the state capital and decorated with carved stone and bronze. The first floor has the society's offices and a lobby; on the second and third are apartments from which the society derives an income. A new two-story annex has been built, providing one large and two small committee rooms, a library and a modern vault for archives. Other speakers were Governor Pinchot; Drs. Arthur W. Booth, Elmira, N. Y., for the Board of Trustees of the American Medical Association; Theodore B. Appel, Harrisburg, for the state department of health; Edward B. Heckel, Pittsburgh, former chairman, Board of Trustees, American Medical Association, and Mr. William M. Denison, for the state department of education. A portrait of Dr. Cyrus Lee Stevens, Athens, secretary of the state medical society from 1896 to 1918, editor of the *Pennsylvania Medical Journal* from 1904 to 1920, and president of the society in 1919, was presented to the society by the Bradford County Medical Society. Dr. Stanley D. Conklin, Sayre, made the presentation address. At present the society plans to establish a package library service similar to that of the American Medical Association, rather than to accumulate bound volumes. Three state societies now have this service, Texas, Indiana and Wisconsin.

SOUTH CAROLINA

Bill Introduced.—H. 422 proposes to accord to hospitals, nurses and physicians, treating persons injured through the negligence of other persons, liens on all settlements or compromises accruing to the injured persons by reason of their injuries.

TENNESSEE

Bill Introduced.—H. 458, to amend the medical practice act, proposes (1) to provide that members of the board of medical examiners shall be appointed by the governor from a list of names submitted by the Tennessee State Medical Association, and (2) that no license shall be revoked until the licentiate has been notified in writing of the charges against him and has been given an opportunity for a full and complete hearing, with the right to be represented by counsel.

University News.—Dr. Gunnar Nystrom, professor of surgery, University of Upsala, Sweden, is in residence at Vanderbilt University School of Medicine as Flexner lecturer during February and March. Dr. Morris Fishbein, Chicago, editor of THE JOURNAL, gave a public address at the university, February 12, on "Social Aspects of Medicine," and Dr. Maurice Brodie, New York, addressed medical students on poliomyelitis immunization.——Kenneth S. Rice, Ph.D., formerly acting head of the department of physiology at the University of Maine, has been appointed to the staff of the department of physiology at the University of Tennessee College of Medicine, Memphis.

TEXAS

Dallas Clinical Conference.—The Dallas Southern Clinical Society will present its seventh annual spring conference, March 18-22, with headquarters at the Baker Hotel. Each morning up to Friday there will be a general assembly with addresses by guest speakers, followed by lecture courses given by Dallas physicians. Conferences will be held at luncheons, and afternoons will be given over to clinics at the Baker Hotel, conducted by the guests. Wednesday afternoon there will also be operative clinics at Baylor, St. Paul's and Medical Arts hospitals and all day Friday will be devoted to hospital clinics. Guest speakers and their subjects for the general assemblies will be as follows:

Dr. Elexious T. Bell, Minneapolis, Minn., Relation of Hypertension to Kidney Disease.
Dr. Harry L. Baum, Denver, Recent Studies in the Treatment of Streptococcic Infection by Means of Specific Immune Serums.
Dr. Henry L. Bockus, Philadelphia, So-Called Chronic Nonspecific Ulcerative Colitis.
Meyer Bodansky, Ph.D., Galveston, Applications of Chemical Pathology to Clinical Medicine.
Dr. Franklin G. Ebaugh, Denver, Psychotherapy in General Practice of Medicine.
Dr. Harry S. Gradle, Chicago, Systemic Causes of Ocular Diseases.
Dr. Alexis F. Hartmann, St. Louis, Diabetes Mellitus in Infants and Children.
Dr. Jennings C. Litzenberg, Minneapolis, Ectopic Pregnancy.
Dr. William E. Lower, Cleveland, Problems of Kidney and Ureteral Calculi.
Dr. Douglas Quick, New York, Radiation and Surgery in Cancer Therapy.
Dr. Waltman Walters, Rochester, Minn., Surgical Treatment of Obstructing Lesions of the Biliary Tract.
Dr. Fred Wise, New York, Dermatophytosis of the Feet and Dermatophytids.

In addition, Dr. H. Earle Conwell, Birmingham, Ala., will conduct two clinics on fractures and Dr. Louis Hamman, Baltimore, will conduct clinics on tuberculosis, leukemia and Hodgkin's disease and will participate in a symposium on heart failure. Monday evening, March 18, there will be a meeting open to the public; Tuesday, symposiums on malignant disease of the head and neck and acute intestinal obstruction; Wednesday the symposium on heart failure; Thursday, the annual dinner, and Friday, a clinic on syphilis at Baylor Hospital. Dr. Curtice Rosser is president of the society, and Dr. David W. Carter Jr., director of clinics.

UTAH

Bills Introduced.—H. 217 and H. 220 propose to repeal the laws regulating the possession, sale or distribution of narcotic drugs. H. 211 proposes to repeal the laws regulating the sale, distribution and possession of narcotic drugs and to enact what apparently is the uniform narcotic drug act.

Annual Registration Due April 1.—All practitioners of medicine and surgery licensed to practice in Utah are required to register annually on or before April 1, with the department of registration, and to pay a fee of $3. If a licentiate fails to reregister within from ninety days to six months after April 1, his license can be revoked and will be reinstated thereafter only on his paying the delinquent registration fees and an additional year's fee as a penalty.

VERMONT

Bills Introduced.—S. 61 proposes to prohibit the sale, distribution or possession of cigarets, cigars or tobacco, or other commodities intended for smoking, containing cannabis indica. H. 254 proposes to prohibit any person, other than a licensed physician or a licensed dentist, to use the title "doctor" or the abbreviation "Dr." in connection with his name on any sign, advertisement, or "professional" card, unless the type of service rendered by him is also designated on such advertisement or "professional" card.

WASHINGTON

Bills Introduced.—S. 290 proposes to permit "any professional or vocational group of persons required by . . . law . . . to pay a license fee or pass examination tests" to form an association with quasi governmental powers. Such association, when organized, is to exercise the powers now exercised by the director of licenses with respect to examining applicants for licenses, hearing grievances against any member, and enforcing the law. H. Joint Memorial No. 30 proposes to petition the United States Congress to pass a law authorizing the deportation of aliens convicted of violating any state narcotic drug act. H. 640 proposes to make it unlawful for "any person, firm or corporation to operate a dental office unless said person shall be a duly licensed dentist within the state of Washington." It shall be unlawful for "any person, firm or corporation operating or managing a dental office in the state of Washington to employ any person as a dentist or a dental assistant unless said person is a duly licensed dentist."

WEST VIRGINIA

Society News.—Dr. Russell C. Bond, Wheeling, addressed the Marshall County Medical Society, Moundsville, January 15, on "Scarlet Fever, Measles and Whooping Cough."—— Dr. Hugh G. Thompson, Charleston, addressed the Fayette County Medical Society, Oak Hill, January 7, on "Surgical Consideration of Diabetes."——Mr. James W. Harris Jr., former secretary to Governor Kump, has been appointed executive secretary of the Hospital Association of West Virginia, with headquarters in Charleston.

WISCONSIN

Society News.—Drs. Richard H. Jaffe, Chicago, and Francis D. Murphy addressed the Medical Society of Milwaukee County, January 11, on "Kidney and Cardiovascular Diseases" and "Nephritis," respectively. The first graduate course of 1935 began January 21, with Dr. Joseph L. Miller, Chicago, as the speaker. At the annual meeting of the society, Dec. 14, 1934, Dr. Austin A. Hayden, Chicago, spoke on "The Institution of American Medicine" and Mr. J. George Crownhart, executive secretary, State Medical Society of Wisconsin, on "Medical Legislation.

Children Barred from Public Places in Scarlet Fever Fight.—Dr. John P. Koehler, health commissioner of Milwaukee, has ordered schools, theaters, churches and other public places to bar all children under 7 years old. The commissioner's action, which was taken February 19 with the approval of the city council, is an effort to curb the epidemic of scarlet fever that has been prevalent since September. There were more than 1,500 cases in the city on that date. Plans have been made by the health department to collect blood from convalescent and recovered patients and to prepare a supply of serum for use in the epidemic. A special laboratory has been arranged at Columbia Hospital for preparation of the serum, the gift of a Milwaukee citizen whose child was benefited by the use of serum. The order isolating young children meant the exclusion from schools of 20,000, closing of kindergartens and almost total closing of first grades.

Bills Introduced.—S. 190 proposes to amend the law requiring all male applicants for licenses to marry to present a physician's certificate showing that they are free from venereal disease by requiring such certificates of both parties to proposed marriages. A. 297 proposes to create an interim committee on the cost of medical care, to consist of two senators and three assemblymen. The committee is to investigate the general subject of the cost of medical care and the ways and means of lightening the burden thereof. A. 403, to amend the workmen's compensation act, apparently proposes to permit an injured employee to elect to receive chiropractic treatment for his industrial injuries. The bill proposes, however, that the exercise by the injured workman of his right to receive Christian science or chiropractic treatments is not to relieve him from the requirement of submitting to and following such competent and reasonable surgical treatment as may be required.

WYOMING

Annual Registration Due April 1.—All practitioners of medicine and surgery licensed to practice in Wyoming are required by law to register on or before April 1, with the secretary of the board of medical examiners, and to pay a fee of $2.50. If a licentiate fails to pay the fee within three months after April 1, his license can be annulled, and if annulled it will be restored to him only on his paying the stated fee, plus $5 as a penalty.

GENERAL

Examining Boards.—The Advisory Board for Medical Specialties is now receiving applications from special examining boards in the process of organization for official approval and representation in this board. Information on the form for these applications may be obtained from the secretary, Dr. Paul Titus, 1015 Highland Building, Pittsburgh, Pa. Action on the applications will be taken at the annual meeting of the advisory board at the Hotel Traymore, Atlantic City, June 9.

Dr. Atwater Named Executive Secretary of Public Health Association.—Dr. Reginald M. Atwater, for eight years health commissioner of Cattaraugus County, New York, has been appointed executive secretary of the American Public Health Association, effective March 15. Dr. Atwater graduated from Harvard Medical School in 1918 and took the degree of doctor of public health at Johns Hopkins University in 1921. Later he was appointed associate professor of hygiene in the Hunan-Yale College of Medicine in Changsha, China, from which position he returned in 1925 to teach in the Harvard School of Public Health.

Special Board Examination.—An examination of candidates for the certificate of the American Board of Psychiatry and Neurology in neurology, psychiatry or both will be held in Philadelphia, June 7-8, preceding the annual session of the American Medical Association in Atlantic City. It will include examination of patients, with reports on and discussion of the observations, June 7; oral and written examinations in neuroanatomy, neurophysiology, psychobiology, psychopathology, neuropathology and the interpretation of roentgenograms, June 8. Applications must be filed not later than April 8. Blanks and further information may be obtained from Dr. Walter Freeman, 1726 Eye Street, Washington, D. C.

Medical Bills in Congress.—*Changes in Status:* S. 1850 has been reported to the Senate, proposing to amend an act entitled "An Act to recognize the high public service rendered by Major Walter Reed and those associated with him in the discovery of the cause and means of transmission of yellow fever," by including Roger P. Ames among those honored by the act. H. R. 2827, the Lundeen social insurance bill, has been voted on favorably by the House Committee on Labor and will be shortly reported to the House. The bill proposes, among other things, to direct the Secretary of Labor to establish social insurance "for the purpose of providing compensation for all workers and farmers who are unable to work because of sickness, old age, maternity, industrial injury, or any other disability." *Bills Introduced:* H. R. 6145, introduced by Representative Dempsey, New Mexico, proposes to prohibit the shipment and transportation in interstate or foreign commerce of cannabis and its derivatives and compounds, except when shipped or transported for medical and legitimate uses by the producer or manufacturer thereof or dealer therein to licensed physicians, surgeons, dentists, pharmacists, druggists and veterinarians, under such rules and regulations as shall be prescribed by the Commissioner of Narcotics.

CANADA

Cancer Program in Ontario.—Dr. James A. Faulkner, newly appointed minister of health for Ontario, has appointed a new cancer commission for the province, to continue a cancer program begun several years ago. Three clinics have already been established in Toronto, Kingston and London, with an expenditure of $300,000 on radium. A subcommittee of the commission will make a study of the distribution of radium with regard to population, technics in vogue and methods of application, under the chairmanship of Dr. Oskar Klotz, Toronto. Besides Drs. Faulkner and Klotz, members of the new commission are Drs. William J. Bell, John W. S. McCullough, John D. Leith, Gordon E. Richards, John G. Fitzgerald, William E. Gallie, George E. Wilson and Duncan A. L. Graham, all of Toronto; Prof. E. F. Burton, professor of physics at the University of Toronto; Drs. William A. Jones, Frederick Etherington and Walter T. Connell, all of Kingston; Robert K. Paterson, Ottawa; William J. Cook, Sudbury, and Frederick J. H. Campbell, London.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Feb. 16, 1935.

Serious Criticism of the Treatment of Fractures: The Teaching of Sir Robert Jones Already Forgotten

In July 1933 the British Medical Association appointed a committee, consisting largely of orthopedic surgeons, to report on the treatment of fractures and associated injuries of the limbs. The report, which has just been published, is a serious criticism of the current treatment, both in private and in hospital practice. There has been a growing feeling among those who have studied the late results that these injuries do not receive the attention they deserve and that great improvement could be brought about by better organization. Comparison of the statistics of the results obtained in organized clinics and of those obtained outside them show a glaring contrast. Thus in 432 adult cases of Colles's fracture treated in organized clinics the average disability period was seven weeks and the number of cases of permanent incapacity was two, while for thirty-eight cases not treated in these clinics the average disability period was twenty-nine weeks and the number of cases of permanent incapacity nine. In forty-five cases of fracture of the shaft of the femur the corresponding figures were twenty-six weeks average disability and one permanent incapacity, against thirty-one cases with sixty weeks' average disability and nineteen permanent incapacities. When the figures for the common fractures (the two mentioned, scaphoid of wrist, clavicle, patella, tibia and fibula, and ankle) were taken together it was found that whereas permanent incapacity occurred in only 1 per cent of cases treated in organized clinics it occurred in no less than 37 per cent of cases not so treated. Moreover, the duration of incapacity was thrice as great in the latter group. During the war, great advances were made in the treatment of fractures under the inspiring leadership of Sir Robert Jones. His recognition of the importance of segregation under one control and of methodical and continuous treatment resulted in extension over a wide area of principles that had been successfully applied on only a small scale. Unfortunately, his fine organization has largely disappeared and the treatment in the majority of hospitals has not materially advanced. In only a few centers is there any organization superior to that which existed twenty years ago.

INADEQUATE ORGANIZATION OF FRACTURE SERVICES

The committee has investigated the fracture services of the large hospitals and found that in the majority there is no efficient organization. The care of the fractures often devolves on the house surgeon, who lacks the knowledge and experience necessary for adequate treatment. On leaving the ward the patient is referred to the massage department, in charge of an officer who has taken no part in the previous treatment. Union of the fracture thus means a complete break in the continuity of treatment.

IMPERFECT SURGICAL TREATMENT

In a high proportion of cases of delayed recovery the fracture was never completely reduced. This was due not simply to inadequate manipulation but to neglect to determine whether or not the manipulation was successful. Failure to use post-reduction x-ray control was frequently responsible. In other cases the important factor was absence of daily supervision of fractures in their early stages, and weeks elapsed before malposition was recognized, so that perfect manipulative reduction was no longer possible. In a smaller proportion of cases, disability was due to recurrence of deformity that had been corrected. Failure to use the best method of immobilization, to control and check progress by roentgen examination and to maintain immobilization sufficiently long, owing to fear of joint stiffness, were responsible for other cases. Neglect of early active mobilization of uninjured joints accounted for prolonged disability in a large number of cases. Joints were allowed to stiffen unnecessarily, and massage and passive movements were relied on to cure what should have been prevented by active exercise. Even when joint stiffness was inevitable, recovery was frequently delayed by adoption of passive methods to the exclusion of active exercise. Stiff joints became stiffer as the result of injudicious stretching and the belief that massage alone will cure muscle wasting, and recurring edema was responsible for many months of delay.

RECOMMENDATIONS

In the opinion of the committee, the essential conditions of an organized fracture service are segregation of cases, continuity of treatment, after-care, and unity of control. Every hospital should segregate its fracture cases and establish one, and only one, organization. Only thus can the staff become sufficiently highly trained and experienced in the technic of modern methods. But such segregation should not exclude any member of the hospital staff interested in fracture treatment. Coordination of the successive stages of treatment is also essential. The patient should not be transferred at a critical stage of treatment from one department to another, or from the care of the surgeon responsible for the initial treatment to one who has no knowledge of or responsibility for it. After-care in the form of active exercises directed to complete restoration of function is essential and is often neglected. It should be directed to the performance of tasks and not consist of massage and electrical stimulation, which have been largely misapplied in the treatment of fractures, and injudicious stretching of joints has actually been done. Massage staffs should concentrate on securing the active cooperation of the patient and teaching him to undertake his own remedial exercises. Finally, these measures achieve their greatest success only under unity of control. All stages must be supervised by one expert. In the smaller hospitals one member of the staff should be selected to do the whole of this work.

Memorial to Florence Nightingale

The National Florence Nightingale Memorial Committee of Great Britain is appealing for funds to raise a living memorial to Florence Nightingale to carry on and extend her great work. Already twenty countries have formed or are forming national committees for this purpose. The memorial, by the enthusiastic agreement of the nurses of all nations, will take the form of endowment in London of postgraduate training in public health nursing and of teaching and administration in schools of nursing. Such courses are already in operation, having been established after the war by the League of Red Cross Societies, with the collaboration of Bedford College for Women and the College of Nursing. Scholarships have been financed by the league, which has now exhausted the money available, and by the efforts of nurses federated in the International Council of Nurses. Some 220 nurses from forty-three countries have completed their training and returned to their home countries to fill positions of importance. The Memorial Committee considers that the standardization of nursing throughout the world is of supreme importance, and hardly less the opportunity given to representative women of all nations to meet in social intercourse and study. It is apt to be forgotten that Florence Nightingale reformed nursing in all its branches, whether civil or military. She revolutionized hospitals and hospital administration, so that, from being in

many cases pesthouses of disease, they became the hygienic and sanitary places known today. The sum required to be raised in Great Britain is $1,000,000.

The Ill Effects of the Smoke Pall of Manchester

In his report for 1933, Dr. D. P. Sutherland, health officer of Manchester, says that the smoke pall, which is constantly present to a greater or less degree over this district, has several adverse effects. Its presence is recorded in the rapid blackening and deterioration of buildings; it reduces by 50 per cent the actinic value of the sunlight and in winter leads to the formation of fog. Sufferers from tuberculosis have their respiration, already impaired by disease, made more difficult by the acute irritation of the impurities in the air. Further inflammation results, resistance is broken down, toxemia increases, and heart failure follows. A correlation between fog and the death rate is shown by statistics. During the fogless period April-September 1933, the average weekly deaths amounted to 12.7. During the fogless winter weeks the average was 14.4 but in the winter foggy weeks it was 16.5. Fogs are associated with an increased death rate from tuberculosis.

PARIS

(From Our Regular Correspondent)

Feb. 8, 1935.

"Deformed" Types of Syphilis

A leading authority on syphilis, Professor Gougerot of Paris, contributed an important article in the *Revue générale de clinique et de thérapeutique,* October 20. The classic dogma that syphilis develops in three periods, beginning with the chancre and invading the body slowly by way of the lymphatics and becoming a systemic infection (by way of the blood vessels) at the time of the secondary manifestations, has been rendered obsolete as the result of modern research. Numerous new conceptions of syphilis have completely changed former teachings. The efficient therapeutic agents of the present day, even though they do not always cure syphilis, modify it greatly and the result is that one finds a disease quite different from the schematic notions of preceding generations. If one is not familiar with the forms of syphilis as modified by modern methods of treatment, there is a great risk of errors in diagnosis with resultant serious danger from the social and familial standpoint. Gougerot groups these altered or, as he terms them, "deformed" types of syphilis, as follows:

1. Primary syphilis retarded in its development by inadequate prophylaxis; that is, before appearance of the chancre. Every method of prophylaxis is liable to be unsuccessful in certain cases. In thirteen cases treated with ointment of mild mercurous chloride the chancre developed in five cases in milder form and at periods varying from thirty-nine to sixty-three days after infection. These failures are seen also following the use of other methods of prophylaxis, even after intravenous use of neoarsphenamine. One should be careful not to assure the patient that syphilis in an attenuated form might not appear at a later period, as if no preventive treatment had been given. If one wishes to avoid failure in prophylaxis, arsenical preparations must be given in as strong doses and over as long a period as though the chancre were already present. The patient must be followed clinically and serologic reactions carried out over a period of from two to four years.

2. Syphilis deformed or retarded by inadequate abortive treatment. In these cases the classic secondary manifestations, instead of appearing forty days after the chancre, are not observed until after ninety days or even as late as 190 days, as in one of Gougerot's cases, at a period when one felt that the syphilis had been aborted by the treatment given at the time of appearance of the chancre. In some of these "retarded" cases only a single secondary manifestation may be observed, in the form of a few mucous patches or of a generalized adenopathy. Some spirochetes persist in the vicinity of the chancre and remain latent, only to develop suddenly at some later period and become disseminated in the body.

3. Early tertiary syphilis because of inadequate treatment. As early as 1910 Gougerot called attention to the fact that, when arsenical preparations had been given for an insufficient length of time, tertiary signs in the form of gummas on the skin and mucous membranes, or serious localized destructive lesions of the viscera or along the course of the cranial nerves, would appear at a comparatively early date. There has been much discussion as to whether these were the result of the syphilitic infection or of the toxic action of the arsenic or both. Gougerot is of the latter opinion, especially in regard to nerve lesions, and hence, instead of arsenical preparations which may increase the toxic element, he prefers to use mercuric cyanide or, better still, a bismuth compound. To avoid such early tertiary manifestations, the treatments should not be given over too short a period or in too small doses, and the intervals should not be over a month in duration.

4. Cases that are either resistant to or show recurrences even after arsenic. These patients often present a papulosquamous psoriasis-like eruption, and even though the disease is active the Wassermann reaction is negative.

PERSISTENCE OF POSITIVE WASSERMANN REACTIONS

In connection with the fourth group of Gougerot's deformed syphilis, a recent paper by Tzanck and his associates, read at the Oct. 19, 1934, meeting of the Medical Society of the Paris public hospitals is of great interest. These observers base their opinions on the observation of more than 10,000 cases of syphilis at St. Anthony's Hospital. They reported fifty-seven cases in which the Wassermann, Hecht and Kahn reactions, made simultaneously, remained positive in spite of treatment given over a period of a minimum of three years. These resistant positive reactions are most frequently observed in cases of visceral syphilis or when there is a complete absence of any manifestation of the disease. There were thirty-two cases treated at regular intervals for at least four years and fifteen others over a period of three years. In none of these resistant seroreaction cases was the patient treated at regular intervals, with multiple preparations and intensively. In the majority the diagnosis of syphilis had been made at the period when a cutaneous eruption or a visceral lesion appeared. In twenty-four of the thirty cases treated for four years, and in eleven of fifteen treated for three years, the positive reactions were discovered during the course of treatment. In the other cases the diagnosis had been made in the primary or secondary period but the treatment had been inadequate. In four persistently positive cases, congenital syphilis had been treated for a long period. After four years of treatment, examination of these persistently positive cases revealed the presence of a visceral syphilis (nervous or aortic) in eleven, mucocutaneous manifestations in five, and nothing in fifteen cases. In all of the forty-seven persistently positive cases, the disease had been inadequately treated in its early stages, no treatment had been given, or it was given too late. In not a single case have Tzanck and his associates ever observed a persistence of a positive seroreaction when the treatment had been given early enough and regularly over a sufficiently long period.

Treatment of Migraine

Dr. Pagniez, who is well qualified through intensive study, directs attention to the progress that has been made during the last twenty years in the etiology and treatment of migraine. In the *Presse médicale,* January 2, he stated that the treatment varies according to the type; he mentions five types.

1. Migraines apparently of digestive origin. A diet that can be easily followed should be given. The only fat allowed is fresh butter. Very good results are obtained in prescribing peptone 0.5 Gm. three quarters of an hour before meals.

2. Migraines of hepatic origin. Here a diet in which all fatty foods are excluded is essential. Regular evacuation of the biliary tract is best attained by ten day treatments with magnesium sulphate and peptone taken before breakfast, followed by the patient lying on his right side for three quarters of an hour, and by the use of the duodenal tube and a 33 per cent magnesium sulphate solution.

3. Migraines of anaphylactic origin. Here the particular food should be looked for the ingestion of which is followed by attacks. Chocolate may be placed at the top of such a list. One should try the well known skin reactions and various diets in which certain foods are omitted, for example milk and eggs or meats or starchy foods. Anaphylaxis due to other causes than foods are rare, but occasionally certain odors, such as tar, will be followed by an attack. The peptones given before meals are especially useful in this type.

4. Migraines of endocrine origin. Here are recognized a thyroid, an ovarian and a hypophyseal type. In the first named, in which there is hypothyroidism, the gland extract helps. In cases of ovarian origin there is usually a hypofunction, and hence estrogenic preparations or anterior pituitary extract are indicated. In those of hypophyseal origin, the posterior lobe preparations are efficacious.

5. Migraines of vascular and sympathetic origin. Small doses of glyceryl trinitrate or the nitrites are best here.

Quite often, migraine presents itself in a less characteristic manner than these types would indicate. These are the so-called mixed cases, for which there are a number of causes. For the latter, one must have a number of preparations in mind. These are the barbiturates, the ergotamine tartrate, used first by Tzanck and Trautmann several years ago, bromides and the boricopotassic or sodium tartrates. Cases of digestive origin are helped by treatment at Vichy, Vittel or Chatel-Guyon. The remainder of the paper takes up in detail the treatment of the attack itself.

BERLIN

(From Our Regular Correspondent)

Jan. 21, 1935.

New Regulations Affecting Medical Practice

The executive committee of the Prussian *aerztekammern* (chambers of physicians) held a session at which some important matters were decided. As previously announced, it is planned to create an ethical council of federal physicians; but it is uncertain just when the plan will be consummated.

One question that came before the committee concerned the sale of a medical practice to a successor. According to the code of ethics of German physicians, such a sale is absolutely inadmissible; for it is not a question of an actual business that, after the death of the owner, must be sold at as high a price as possible. Only material goods are subject to sale. In any event, it is impossible to make the number of patients the basis of intrinsic value. It has been observed also in many cases in which a sale of a practice was effected that the purchasing physician later sought to have the contract canceled because he felt that the practice had not turned out as represented. That is explained by the fact that a portion of the patients, after the death of the former owner of the practice, transfer their patronage elsewhere, with the result that the practice shrinks. The executive committee decided that, before a contract concerning the transfer of a medical practice can be consummated, the consent of the competent chamber of physicians must be secured, whereby also the material possessions of the decedent will be appraised at their proper value.

In the matter of physicians' signs affixed to the house in which a medical practice is carried on, the report brought out that "great confusion prevails, particularly in the large cities," in spite of the fact that definite regulations have been in force for years. In some sections startling incongruities have arisen, while in other sections there is some semblance of order. In spite of former action on the part of medical organizations, the necessary reforms have not been carried out. The medical profession must never, in its external manifestations, adopt the methods of industrial plants.

Contrary to former decisions, no medical specialist may in the future designate two branches of medicine in which he is specializing, even though he has had special training in two specialties. Likewise, no specialty will be recognized that is not specifically mentioned in the "richtlinien" (medical standards) adopted by the medical profession. The same rules apply to public notices, letter heads and prescription blanks and patients' record cards, which have been issued of late to patients by some of the enterprising physicians and which the patients are expected to bring with them for later consultations, in order that their personal histories may be looked up. Also these record cards must be held strictly within the prescribed limits. Physicians' signs may not bear any statement as to their hospital activities; as to service as director or head of a department, or the like. It was further decided that there is no general need of having physicians' signs illuminated at night.

Another question concerned the seasonal changing of one's place of practice. For some time past, the physicians who are permanently located in watering places have complained that, during the summer months, a large portion of their practice is taken away from them by the physicians who accept service at health resorts for the summer season. The physicians who are permanently located in the place have but little practice other than during the season, so that they are to a great extent dependent on the summer guests. In view of this fact the seasonal change of one's place of practice has been prohibited.

For the prevention of illegal interruptions of pregnancy, the minister of justice has been requested to establish a special department in the state's attorney's office for the handling of such cases or to declare illegal interruption of pregnancy to be a treasonable act and hence subject to a severe penalty.

For the early recognition of cancerous disease, the possible value of establishing special consultation hours in the policlinics was discussed. It was decided that, during the coming year, every physician must take a course in the diagnosis of cancer, the time and place to be designated by the chamber of physicians having jurisdiction. Great care must, however, be taken not to awaken undue fear of cancer among the people.

The Students' Health Service

The goal of the Studentischer Gesundheitsdienst is to aid students in the acquisition of health free from hereditary taint and the ability to think and act in keeping with the best traditions of their race; application of economic measures for the aid of the sick (which were available to a wide extent also under the old régime); prophylactic measures, and elimination of the unfit. Hence, since the beginning of the summer semester of 1934, all students must submit to a physical examination, in which work the bureau of public health of the national-socialist party cooperates. This arrangement, it is asserted, furnishes a guaranty that the examinations will take into account all the questions that are considered important for the selection of future academic leaders. A card index preserves a record of all noteworthy observations. In the future the question of admitting the questionably fit to academic studies will be decided by the results of the compulsory examination. In order that no one may escape being examined, the penalty for such

evasion is exclusion from university studies. The sanitary record card accompanies the student as a "health passport" throughout his whole university career. The last great task, the biologic selection, has not yet been begun. This is regarded, however, as the most important control feature. "The elimination of the unfit is designed to protect the biologically valuable progeny at the universities from the damaging competition of the undesirables." When these important tasks have been more generally applied, it will be necessary to afford this biologically valuable progeny an opportunity to marry and receive an adequate beginning salary. This will necessitate a shortening of professional training in the interest of the people as a whole.

MOSCOW

(From Our Regular Correspondent)

Jan. 29, 1935.

The Histologic Conference

The first All-Russian Histologic Conference was held in Moscow in 1934, with 362 delegates from thirty-nine towns. Among them were eighty-eight professors, eighty private assistant tutors, 134 assistants and forty-eight aspirants. Prof. A. V. Nemilov read a paper on the present state of the cellular theory. He considers the cell a certain stage in the development of the organism and thinks that the only true cell in the real sense of the word is the ovum at the moment of impregnation. Roumiantzev spoke about tissue cultures. He analyzed the evolution process in vitro and in vivo and compared the process of growth and differentiation of various tissues.

The report of G. J. Roskin on growth and fission of cells and tissues attracted special attention. He studied the influence of light and medicaments on cells and proposed a theory on the influence of quinine on cells. He finds that, after penetrating the cell, quinine accumulates in the granular elements, after which occurrence the granulations do not take a stain. In connection with this phenomenon, a disturbance of digestion and of other functions of the organism takes place.

F. M. Makarenko spoke of a new method of tissue transplantation by means of introducing small pieces of tissue with celloidin under muscular fascias. The growth of cells around the celloidin and a further differentiation of the tissues may be observed.

Treatment of Diseases of the Vegetative Nervous System

Dr. R. A. Grot three years ago began treating diseases of the vegetative nervous system by means of diathermy of different regions of the vagus nerve, by which method he has healed skin, stomach and leg ulcers. The best results were obtained in the treatment of tabes dorsalis by diathermy of the neck and ischiolumbar regions of the vegetative nervous system. Chronic patients show a reestablishment of the pupillary reaction to light, and the atrophic process in the ocular nerve stops. The observations of Dr. Grot were verified in the institute of Setchenov on 200 patients. This makes it possible to expect that the treatment of trophic disturbances by means of diathermy of corresponding regions of the vagus nerve will permit the treatment of diseases at present considered incurable.

The Moscow State Scientific Medical Library

The Moscow State Scientific Medical Library was founded in 1929 and had then about 35,000 volumes. At present it has more than half a million volumes and 32,000 readers. It supplies with books all the physicians of the Soviet Union. The library selects literature on all medical questions and sends it on request to China, Japan, Argentina, Australia and all the European countries. The "Great Soviet Medical Encyclopedia," which will be completed in a few years (the thirty-first volume has already appeared), is published under the bibliographic supervision of this library. At present the library is situated in an old house in the center of Moscow, but in the near future there will be erected a special building.

MEXICO

(From Our Regular Correspondent)

Jan. 28, 1935.

A Method of Vascular Dissection

Dr. Quevedo reported, before a meeting of surgeons in Mexico City last November, the results of his observations on the distribution of the arteries in the kidney by washing the renal and polar arteries, followed by injection of stains of different color into those arteries, by the posterior route, and destruction of the renal parenchyma by a corrosive substance, which attacks the renal tissue but not the renal arteries. The anatomic specimens obtained by this technic are very clear. Even the most minute arterial ramifications are visible with greater clearness than they are in the best anatomic dissections. He thus found a polar artery in nineteen kidneys of his series of thirty. It was in the upper pole in thirteen kidneys and in the lower pole in six kidneys. He noticed also that the polar artery supplies a large area, sometimes a third or a fourth of the renal parenchyma. This area may become necrosed following an infarction during an operation on the kidney. Dr. Quevedo's study is important to renal surgery and also as a method for the study of the arterial distribution in other organs; for instance, in the heart, a similar study of the coronary arteries would clarify the picture of such conditions as cardiac infarction and angina pectoris.

Congress of Physicians of the Pan-American Railways

The first Congress of Physicians and Surgeons of the Pan-American Railways will meet, May 5, in Mexico City, as a part of the program of festivities for the opening of the Central Hospital, which was built by the Mexican National Railways at a cost of 1,500,000 Mexican pesos (about $405,000). Physicians and surgeons of all American railroads have been cordially invited to attend. The invitations have been sent both directly from Mexican physicians and through the secretariat of foreign affairs and the consular offices in the United States and the countries of South America, Central America and Canada. The head surgeon of the Mexican National Railways has invited certain physicians to present papers on occupational diseases of workers on railroads and has requested them to send at their earliest convenience a summary of their papers, in order to prepare the program; also a note stating the number of tickets they desire. After the congress the attendants will be taken to the most interesting places in Mexico City and its surroundings.

Marriages

SKOTTOWE BELLINGER FISHBURNE, Columbia, S. C., to Miss Bernice Robertson Pollok of Danville, Va., January 12.

LEON RAPHAEL STATON, Hendersonville, N. C., to Miss Nancy Terrell of Lynchburg, Va., January 12.

AMOS NEILL JOHNSON of Garland, N. C., to Miss Mary Allan of Fort Lauderdale, Fla., February 6.

JOSIAH EDGAR HAYNESWORTH, Buckingham, Va., to Miss Paula Irving of Farmville, January 19.

JOE GIDEON HUFSTEDLER, Knoxville, Tenn., to Miss Boatwright in Memphis, January 26.

WILLIAM T. BARRON JR., Manning, S. C., to Miss Eve Gable of Sumter, Oct. 26, 1934.

FRANK SABISTON to Miss Ethel Anne Roberts, both of Kinston, N. C., January 15.

JOHN CHAMPLIN to Miss Frida Moehl, both of Westerly, R. I., January 30.

Deaths

Franklin H. Martin ✠ died of coronary thrombosis while in Phoenix, Ariz., on Thursday, March 7, aged 77 years. His death culminated a career devoted to organizational efforts, particularly in the field of surgery, leading toward the advancement of that specialty in medical science and toward a better understanding by the public of the work of the physician. Only recently Dr. Martin had completed and published his autobiography under the significant title "The Joy of Living" and also a record of the work of the Council of National Defense—Medical Section—during the World War.

Dr. Martin was born in Ixonia, Wis., July 13, 1857. Following his education in the public schools and academies of Wisconsin, he received his medical education in Northwestern University Medical School, Chicago, graduating in 1880, and filled an internship in Mercy Hospital until 1881. In 1886 he married Isabelle Hollister, daughter of John Hollister, founder of Northwestern University Medical School. During the same year he became professor of gynecology in the Chicago Polyclinic. In 1880 he undertook organization of the Postgraduate Hospital School of Chicago and from that time continued to devote himself to educational work and to his practice in gynecology. He published a number of monographs in that field, including one on "Treatment of Fibroid Tumors of the Uterus" in 1897 and "Treatise on Gynecology" in 1903.

However, his most significant work began with the establishment of *Surgery, Gynecology and Obstetrics* in 1905, to which, in 1913, was added the *International Abstracts of Surgery*. The development of this publication and its relationship to surgical practice led to the formation of the Clinical Congress of Surgeons of North America in 1910 and thereafter the American College of Surgeons in 1913. In this work were associated such leaders in American surgery as Drs. William J. Mayo, A. J. Ochsner, John B. Murphy and George W. Crile. Many of the accomplishments of Dr. Martin for the advancement of surgery depended on the manner in which he was able to secure the whole-hearted cooperation, many times at great self sacrifice, of distinguished leaders in the field of surgery in this country.

FRANKLIN H. MARTIN, M.D., 1857-1935

During the great war, Dr. Martin was asked by President Woodrow Wilson, in October 1916, to head the development of medical participation. He was chairman of the general medical board of the Council of National Defense and a member of the executive committee under which state and county committees of medical men were organized. He was also responsible for the development of the Volunteer Medical Service Corps, in which numbers of American physicians enrolled. During his participation in military activities he was Colonel in the Medical Corps of the United States Army, and with the American Expeditionary Forces for three months.

His position of leadership and the success of his efforts brought to him honors and recognition from many places. Among other decorations were the Companion of the Order of St. Michael and St. George, bestowed by King George V of Great Britain, Nov. 13, 1919; the Distinguished Service Medal of the United States Government, and the Order of Commander of the Crown of Italy. He received also the LL.D. of Queen's University, Belfast, Ireland, of the University of Wales, Cardiff, and the University of Pittsburgh. There was given to him the honorary D.Sc. of Northwestern University and D.P.H. of the Detroit College of Medicine and Surgery.

Not only as a leader in the field of medicine, however, did Dr. Martin serve his fellowmen. He edited *Surgery, Gynecology and Obstetrics* continuously from its foundation to the day of his death. He was director general of the American College of Surgeons from its organization in 1913 to the day of his death. He was president of the American College of Surgeons in 1929, president of the International Association of Gynecologists and Obstetricians in 1919, Trustee of Northwestern University from 1921 to 1931, and a member of boards of trustees and adviser to many other educational scientific organizations and institutions. He extended the influence of the American College of Surgeons to European and South American countries and, in association with this work, received the honorary fellowship and membership of many of them. He contributed liberally to civic organizations both in Chicago and elsewhere.

Among other activities was the founding and leadership of the Gorgas Memorial Institute of Tropical and Preventive Medicine, a plan of considerable scope proposed with the idea of extending medical knowledge widely to the public and to enlist public support, which seems to have failed to fulfil the scope that its founder conceived for it.

In his leadership of the organizations that he founded and directed, Dr. Martin revealed an imaginative brain, a quick comprehension of public interest, and initiative that was highly alert almost to the day of his death. One found his organization continually creating new committees and new investigative bodies as rapidly as the changing conditions of our civilization indicated their desirability. The development of the motion picture, the rise of industrial medicine, the trend toward social security, and many similar developments were promptly recognized by his organization in the manner that has been mentioned. Dr. Martin was a genial man, a lover of music and of all the arts, and a widely traveled citizen of the world. His commanding appearance, his quick and humorous eye, his alert carriage and the brilliance of his personality brought him recognition and prestige which he more than merited.

Elmer Isaac McKesson ✠ Toledo, Ohio; Rush Medical College, Chicago, 1906; past president of the Academy of Medicine of Toledo and Lucas County, the International Anesthesia Research Society, and the Interstate Association of Anesthetists; member of the Associated Anesthetists of the United States and Canada; aged 53; member of the staff and anesthetist to the Toledo Hospital, St. Vincent's Hospital, Lucas County Hospital, Toledo State Hospital and the Flower Hospital, where he died, February 22.

Archibald Cecil Kane, Oak Park, Ill.; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1920; member of the Illinois State Medical Society; instructor in laryngology, otology and rhinology, University of Illinois College of Medicine, Chicago; served with the British Army during the World War; consulting surgeon to the Municipal Contagious Disease Hospital, Chicago, and formerly on the staff of the Illinois Eye and Ear Infirmary, Chicago; aged 42; died, February 10, of coronary thrombosis.

Daniel Roe Ayres, New York; Columbia University College of Physicians and Surgeons, New York, 1909; assistant professor of gynecology, New York Post-Graduate Medical School of Columbia University; fellow of the American College of Surgeons; at various times on the staffs of the Southside Hospital, Bay Shore, New York City Hospital and the Post-Graduate Medical School and Hospital; aged 51; died, February 21, of pulmonary and laryngeal tuberculosis.

Arthur Hartley, Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1898; professor of applied anatomy at his alma mater; fellow of the American College of Surgeons; served during the World War; aged 62; on the staffs of the Delaware County Hospital, Drexel Hill, the Women's Homeopathic Hospital, St. Luke's and Children's Hospital and the Hahnemann Hospital, where he died, February 10.

Joseph Raymond Burns, Syracuse, N. Y.; Syracuse University College of Medicine, 1907; member of the Medical Society of the State of New York; associate professor of clinical obstetrics at his alma mater; on the staffs of the University Hospital, Hospital of the Good Shepherd, St. Joseph Hospital and the Syracuse General Hospital; aged 48; died, January 29, of chronic arteriosclerotic nephritis and myocarditis.

Caroline Carle Lawrence, Long Beach, Calif.; Woman's Medical College of Pennsylvania, Philadelphia, 1894; for many years medical inspector in the public schools of Gary, Ind.; formerly a medical missionary; at one time college physician and professor of hygiene at the Elmira (N. Y.) College; aged 65; died, January 30, of a hip fracture received in a fall and of acute nephritis.

Frank M. Durham, Columbia, S. C.; Medical College of the State of South Carolina, Charleston, 1903; member of the South Carolina Medical Association; veteran of the Spanish-American War; aged 59; died, February 1, in the South Carolina Baptist Hospital, of injuries received when struck by an automobile.

Thomas Milton De Arman, Miami, Okla.; University of Oklahoma School of Medicine, Oklahoma City, 1928; member of the Oklahoma State Medical Association; aged 33; died, January 28, in the Oklahoma General Hospital, Oklahoma City, of complications following pneumonia.

Jacob Ziegler Hoffman ✠ Wichita, Kan.; University of Pennsylvania Department of Medicine, Philadelphia, 1886; past president of the Sedgwick County Medical Society; chief of the medical staff of the Wichita Hospital; aged 72; died, January 28, of coronary thrombosis.

Oscar Franklin Blank, Los Angeles; Bellevue Hospital Medical College, New York, 1889; member of the board of St. Luke's Hospital, Bethlehem, Pa.; aged 67; died, January 25, in the California Hospital, of bronchopneumonia, following an abdominal operation.

Philip Elwood Stigers, Hancock, Md.; Jefferson Medical College of Philadelphia, 1887; member of the Medical and Chirurgical Faculty of Maryland and the West Virginia State Medical Association; aged 70; died suddenly, January 29, of heart disease.

Charles A. Bevan ✠ West Haven, Conn.; Medico-Chirurgical College of Philadelphia, 1887; health officer of West Haven for many years; at one time member of the school board; aged 85; died, January 29, of cerebral hemorrhage.

Ernest Lacy Smith, Eastman, Ga.; University of Georgia Medical Department, Augusta, 1899; member of the Medical Association of Georgia; aged 59; died, January 28, of cerebral hemorrhage, while visiting at the State Hospital, Milledgeville.

Charles McIlroy Brown ✠ Kansas City, Kan.; University Medical College of Kansas City, Mo., 1913; on the staffs of the Bethany and Providence hospitals; aged 46; died, January 13, of acute dilatation of the heart and pulmonary edema.

Charles H. Teasdale, Crystal Springs, Miss.; University of Louisville (Ky.) Medical Department, 1884; Civil War veteran; aged 90; was found dead, January 21, as the result of his clothing being ignited from an open fireplace.

Andrew Jackson Hesser, Hollis, N. Y.; Western Pennsylvania Medical College, Pittsburgh, 1896; veteran of the Spanish-American and World wars; formerly a missionary; aged 67; died, January 22, of heart disease.

Edward Tanner ✠ Battle Creek, Neb.; University of the City of New York Medical Department, 1879; past president of the Madison County Medical Society; aged 79; died, January 29, of arteriosclerosis and pneumonia.

John H. Hendrix, Hawkinsville, Ga.; Atlanta College of Physicians and Surgeons, 1902; formerly mayor of Jasper and member of the board of education; aged 57; died, January 24, of influenza and heart disease.

Michael Dugan Spurck, Los Angeles; University of Pennsylvania Department of Medicine, Philadelphia, 1904; aged 52; died, January 29, in the Queen of the Angels Hospital, of cerebral hemorrhage.

Arthur Leonard Jacobson ✠ Seattle; Johns Hopkins University School of Medicine, Baltimore, 1921; on the visiting staff of the King County Hospital; aged 39; died, January 28, of heart disease.

Pasquale Conca ✠ Providence, R. I.; Regia Università di Napoli Facoltà di Medicina e Chirurgia, Italy, 1899; on the staff of the Homeopathic Hospital; aged 62; died, January 28, of pneumonia.

Lily Victoria Hampton, Portland, Ore.; Willamette University Medical Department, Salem, 1889; aged 67; died, January 27, of myocarditis, arteriosclerosis and cerebral hemorrhage.

Philip Israel Levine ✠ Brooklyn; New York Homeopathic Medical College and Flower Hospital, 1927; aged 31; died, January 18, of a cranial lesion and acute encephalitis.

George W. Eggleston, Hudson, N. Y.; National Homeopathic Medical College, Washington, D. C., 1895; died, January 30, of hypertrophy of the prostate.

George Ash Taylor, New York; University of Maryland School of Medicine, Baltimore, 1890; aged 67; was found dead in bed, Dec. 30, 1934, of heart disease.

Paul Lawrence, Haughton, La.; University of Louisiana Medical Department, New Orleans, 1867; aged 95; died suddenly, Nov. 3, 1934, of angina pectoris.

William Chase Bennett, Toledo, Ohio; Rush Medical College, Chicago, 1893; served during the World War; aged 67; died, January 31, of carcinoma.

Joseph Etienne Telesphore Dussault, St. David de Levis, Que., Canada; Laval University Faculty of Medicine, Quebec, 1894; aged 63; died, January 1.

Lorne De Corsia MacIntosh, Hartland, N. B., Canada; McGill University Faculty of Medicine, Montreal, Que., 1904; aged 58; died, Dec. 11, 1934.

Fred L. Duckworth, Monticello, Ark.; Chattanooga (Tenn.) Medical College, 1905; aged 52; died, January 24, as the result of a cerebral hemorrhage.

Christopher Harfield West, Mayne, B. C., Canada (licensed in British Columbia in 1923); aged 74; died, January 13, of angina pectoris.

Henry Perkins Stockwell, Stanstead, Que., Canada; McGill University Faculty of Medicine, Montreal, 1898; aged 59; died, Dec. 29, 1934.

Joseph Rainford Warren, New York; McGill University Faculty of Medicine, Montreal, Que., Canada, 1918; aged 51; died, Dec. 28, 1934.

Tecumseh D. S. McCall, Caliente, Nev.; St. Louis College of Physicians and Surgeons, 1888; aged 68; died, January 5, of uremia.

Florence John Halloran, Chatfield, Minn.; Rush Medical College, Chicago, 1888; aged 76; died, January 23, in Jackson, of urinary calculi.

Lesco Albert Robinson, Spokane, Wash.; Rush Medical College, Chicago, 1896; aged 63; died, January 19, of influenza and heart disease.

John A. Thompson, McComb, Ohio; Homeopathic Hospital College, Cleveland, 1881; aged 86; died, Dec. 28, 1934, of arteriosclerosis.

Thomas A. Lowery, Fort Worth, Texas; Physio-Medical College of Texas, Dallas, 1906; aged 66; died, January 18, of pneumonia.

Thomas Winfield Tuggle, New York; Medical College of Ohio, Cincinnati, 1882; aged 73; died, Nov. 12, 1934, of coronary thrombosis.

Wilbert A. Uhl, Baldwin City, Kan.; Fort Wayne (Ind.) College of Medicine, 1882; aged 75; died, January 7, of myocarditis.

Egbert A. D. Goldsmith, Seattle; Chicago Homeopathic Medical College, 1903; aged 58; died, January 18, of heart disease.

Laban Theodore Loar, Gary, Ind.; Louisville (Ky.) Medical College, 1891; aged 74; died, January 16, of bronchopneumonia.

Adam E. Vrooman, Lindsay, Ont., Canada; Faculty of Medicine of Trinity College, Toronto, 1872; died, January 27.

CORRECTION

Dr. Garcelon Was Not Officer of American Medical Association.—The statement in the obituary notice of Dr. Alonzo Marston Garcelon of Lewiston, Maine, in THE JOURNAL, March 2, that he was a Trustee of the American Medical Association, 1883-1901, and in 1901 was elected Vice President, was an error. Dr. Alonzo Garcelon of Lewiston, who died in 1906, was an officer of the Association.

Bureau of Investigation

G. R. BIGLER, QUACK
A Medical Mail-Order Prostate Treatment Declared Fraudulent

G. R. Bigler of Springfield, Ill., is not a physician, chemist or pharmacist, nor does he employ a physician, a chemist or a pharmacist, yet for some time prior to Nov. 21, 1934, this man was engaged in the sale through the mails of a preparation called "Bigler's Guaranteed Prostate Treatment" for the alleged relief and cure of "prostate trouble." On the date mentioned the United States mails were closed to Bigler under his own name as well as under the names "Bigler's Prostate Treatment," "Bigler's Guaranteed Prostate Treatment" and Bigler Company.

As is common in all such cases, Bigler secured business through advertisements placed in periodicals and magazines offering his alleged treatment for sale. A typical advertisement read as follows:

> "PROSTATE SUFFERERS
> GET QUICK RELIEF
> and positive results with our inexpensive home treatment. Send for guaranteed trial offer and valuable information free.
> BIGLER CO. SPRINGFIELD, ILLINOIS"

Those who answered such advertisements received a form letter from Bigler in which they were urged to "act at once and get Bigler's Guaranteed Prostate Treatment on our liberal money-back guarantee that you must get satisfactory results and relief." The treatment was said to be different from other "home treatments" and consisted in applying "a positive treatment directly to the prostate." It was said to be "a valuable ointment" that, if given by a physician, "would probably cost ten times as much." The "home treatment" consisted of the ointment and some tablets and three finger cots to be used in applying the ointment. The "treatment" cost $4.85. When analyzed by the government chemists, the ointment was found to be a simple mixture of petrolatum and wax. The tablets were hexamethylenamine.

The postal authorities, under date of Oct. 18, 1934, notified Bigler and his various-named concerns to show cause by Nov. 12, 1934, why a fraud order should not be issued against them. No one representing Bigler or his companies appeared at Washington on the date set, but a written answer, together with certain documentary evidence, was submitted. The government was able to show, of course, that the so-called Bigler treatment did not "give immediate relief" to persons suffering from "prostate trouble" nor did it remove or assist nature to remove, the cause or causes of such disorders. The government also showed that the daily massage of the prostate gland, as recommended by Bigler, might in many cases be harmful. Government experts pointed out, further, that although Bigler was recommending his treatment to all persons suffering from prostate trouble, regardless of their age or the cause of the condition, the treatment, which was the same in all instances, was neither rational nor scientific.

Bigler promised to refund all remittances to those who did not get "satisfactory results" after using the treatment for thirty days. It was shown that, as a matter of fact, he refused to make such refunds in many instances, due to the fact that purchasers had not written him every five days for the purpose of keeping him informed as to any alleged progress. Investigation also disclosed that, in some instances, instead of affording relief, the Bigler treatment actually increased the symptoms and caused the user greater pain. In such cases, if the user discontinued the treatment, he was automatically deprived of any opportunity, under the terms of the guarantee, to obtain a refund.

In view of all the facts, Judge Karl A. Crowley, Solicitor for the Post Office Department, declared that, on the evidence, he found Bigler's scheme to be one for obtaining money through the mails by means of false and fraudulent pretenses, representations and promises, and he recommended that the Postmaster General close the mails to Bigler and his various-named concerns. As already stated, the mails were so closed on Nov. 21, 1934.

Correspondence

CONSTITUTION AND HEART DISEASE

To the Editor:—A recent editorial in The Journal (January 19, p. 221) deals with a publication on constitution and heart disease by Raymond Pearl and Antonio Ciocco, who examined a number of cases of heart disease regardless of type and etiology and found no relationship between heart disease and body build.

Permit me to point out what appears to me to be the basic error that underlies the study of these authors as well as the editorial opinion concurring with their conclusions.

It would be totally unreasonable to any student of medicine to search for a possible constitutional type in a group of cases of pulmonary disease comprising patients with pulmonary tuberculosis, chronic bronchitis, pulmonary neoplasms, lung abscess, pleurisy, pneumonoconiosis, emphysema, and other diseases. Such a study would certainly fail to reveal any relationship between pulmonary disease and any single constitutional body type. Such a study would be a waste of time, because it would be expected from the outset to reveal nothing of importance. On the other hand, it is well known that there is a definite relationship between the asthenic body build and pulmonary tuberculosis.

It is just as unreasonable to base a similar study on a group of patients with cardiac disease of all kinds, as the authors did, disregarding the etiology and the anatomic type of the disease.

The principles of cardinal importance in the study of constitutional factors lead too far back into the fundamental sciences of embryology and endocrinology to be entered into here. I deem it important, however, to emphasize the fallacy of a statistical study such as the one referred to.

Another study, which illustrates the correct approach and which has demonstrated observations not at all in accord with those of Pearl and Ciocco, is that of Otto Willner (*Am. J. M. Sc.* **180**:200 [Aug.] 1930). His observations, based on examinations of 150 Chinese adults, clearly showed the existence of a definite relationship between the asthenic build and mitral configuration of the heart and a large angle of the electrical axis on cardiographic examination.

Statistical studies just for the sake of statistics are one thing. Studies based on thoughtful regard for the type of disease concerned are another.

Marcus Backer, M.D., Bridgeport, Conn.

EXPERIMENTAL ACROMEGALY

To the Editor:—Although it is a minor matter, I cannot forbear to protest concerning the statement that "one of Evans's students working in Cushing's laboratory at Harvard produced experimental acromegaly" in your answer in Queries and Minor Notes (Use of Pituitary Preparations for Increasing Growth, The Journal, February 9, p. 498). The article to which you refer (Studies in Acromegaly: VIII. Experimental Canine Acromegaly Produced by Injection of Anterior Lobe Pituitary Extract, *Arch. Surg.* **18**:1708 [part 2] 1929) is by Tracy J. Putnam, Edward B. Benedict and Harold M. Teel. The long experimentation to produce an active extract (*Am. J. Physiol.* **84**:157 [Feb.] 1928) and the planning of the work was done by Dr. Putnam, with the fragmentary assistance of Dr. Benedict and (the then) Mr. Teel. Dr. Teel's contributions to endocrinology, and the splendid bulk of Dr. Evans's own work, are such that I know these men would be the first to deplore the inferred or solitary ascription to them of work

done by another, regardless of the rivalry of experimental laboratories. As a one-time fellow in charge of the Cabot Laboratory of Surgical Research, where Dr. Putnam's work was done, I should like to ask that this correction appear in your columns.

A. J. McLEAN, M.D., Portland, Ore.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

BLADDER PAIN

To the Editor:—A woman, aged 25 and unmarried, has had a bladder ailment for many years. She has frequent spells, apparently of vesical spasm, which give her severe, cramplike pains. Cystoscopy on several occasions has revealed a normal bladder lining membrane, and no pus or organisms are found in the urine. At the times when these pains are present she also has frequency of micturition. During the attacks she obtains some relief from camphorated tincture of opium, but her greatest relief is obtained from simple bladder irrigations. About a year ago she had a simple appendectomy, at which time a cyst was removed from the right ovary. There was no malposition of the uterus, and the pelvic organs were otherwise normal. Since this operation the patient's menstrual symptoms have been somewhat more pronounced and she takes ovarian extract hypodermically at her menstrual time. If this is published, please omit name.

M.D., Alabama.

ANSWER.—There are several possibilities to consider in determining the cause of the bladder pain.

First, it is important to rule out the possibility of chronic urethritis. The examination for the presence of infection in the urethra should include careful inspection of Skene's glands, stripping the urethra for pus, search for tenderness and, possibly, the exploration of the urethra with diagnostic bougies for the presence of strictures.

It is possible that the symptoms may be due to so-called elusive or Hunner's ulcer of the bladder. As is well known, many of these patients have a clear urine, free from pus and organisms, and yet, on careful cystoscopic examination, areas of ulceration may be seen at one time, and at other times the ulcers will be healed and one sees small areas of increased vascularity that bleed when the bladder is fully distended.

It is necessary in an obscure case of this kind to rule out the presence of stone in the ureter by means of a roentgen examination.

Lesions of the upper tract may be ruled out by an intravenous pyelogram.

If the complete survey of the urinary system is negative, a complete physical examination should be done to rule out the presence of obscure disease in the central nervous system that might account for the bladder symptoms. This at times is a difficult task, calling for the services of an expert neurologist.

Very rarely, bladder disturbance may be due to allergy.

Finally, in view of the fact that the patient has been operated on, a careful examination should be made of the pelvis. Every once in a while bladder symptoms may be due to trivial lesions in the cervix, as it is well known that symptoms of this kind have disappeared following cauterization of the cervix.

SPEECH TRAINING AFTER CLEFT PALATE OPERATION

To the Editor:—My 22 months old baby boy was born with a right complete cleft of the soft hard palate, the alveolar arch and the lip. He was immediately placed in the hands of an able surgeon, who completed a splendid repair when the child was 14 months old. Now that he has begun to talk he has been unable to pronounce letters that depend on the soft palate. He pronounces m and n well but pronounces "daddy" as though it were spelled with n and says nang for bang, and so on. Will you kindly advise what measures may help in speech training, voice culture or phonetics to overcome this impediment?

D. K. MATTHEWS, M.D., Dresden, Ohio.

ANSWER.—Perhaps the most important single factor in correct speech is a freely movable muscular sphincter that includes the superior constrictor of the pharynx and a freely movable soft palate. If the soft palate does not completely close, there will be a leak of air into the nose and consequently nasal speech—and, unless corrected, the inability to make the hard consonants understood. M and n normally go through the nose. However, trouble in making people understand hard consonants is apt to set up a vicious circle in a child's speech in that he says them rapidly to get it over with and may become discouraged and even lazy in attempting to overcome the difficulty. This point is illustrated by the child's being able to say mama but not being able to say daddy. The first consideration in the repair is to decide whether further surgery in an effort to lengthen the palate would be of benefit. Whether or not operation is done or is necessary, it is almost always necessary for the child to have careful speech training to get good speech. This is best accomplished by one trained in the work, and most communities nowadays have such a trained worker available either in special institutions or in public schools. Where this is not available, it is probably worth while for the mother herself to arrange a consultation with a speech trainer and learn some of the fundamentals of the methods used. Then it is best to have classes at definite periods with the patient, encourage him, reward him and show him the benefits of clear speech rather than correct him each time he makes an error in speech. It is preferable, if possible, to have this help given by some one outside the family who is not accustomed to the child's speech. The Central Institute for the Deaf, 818 South Kingshighway, St. Louis, can probably supply more definite information.

EOSINOPHILIA IN TRICHINOSIS

To the Editor:—In trichinosis, as the patient improves, there is an increase in eosinophilia. While I know that it is a good prognostic sign, why should it occur? Please omit name.

M.D., New York.

ANSWER.—T. R. Brown (*J. Exper. Med.* **3**:315, 1898) reports the eosinophil count in a case of trichinosis in which a blood count was made daily, beginning six or seven weeks after the patient reported the onset of symptoms. The count was continued for sixty-nine days. The percentage of eosinophils was 37 on admission, declined to 8.3 in eighteen days, rose again gradually to a maximum of 68.2 fifty days after admission, or from thirteen to fourteen weeks after the onset of symptoms, and declined to 16.8 on discharge of the patient from the hospital nineteen days later.

In trichinosis the percentage of eosinophils increases and the neutrophils decrease as the trichinella larvae migrate from the intestine into the muscles. The increase may continue into the period of convalescence and remain above normal for months or even a year after the initial rise. There is considerable variation in the percentages of eosinophils reported in different cases of trichinosis and at different intervals in the same case. There is no conclusive evidence that the rise always occurs with the onset of convalescence. The migration of larval worms initiates the increase in eosinophils. The rate at which larvae are liberated and the number entering the muscles are both liable to adjustments as the result of environmental conditions in the bowel where the feeding adults occur. The percentages of eosinophils in the blood to some extent represent the cumulative effect of the migrations, and the occurrence of a maximum in convalescence is probably a lag effect.

YEASTS IN STOOLS

To the Editor:—Can you give me any references on the possible pathogenicity of (or associated pathologic changes with) abundant yeasts in feces that are otherwise normal? An arthritic woman, aged 53, who has lived as a missionary in the tropics but who has never had sprue or intestinal parasites so far as known, in the past had "mucous colitis," apparently mild. In a series of five stools examined for parasites (negative) abundant clumps of oval yeasts were found, with a few associated pus cells. Eosinophilia (5 per cent) is present. Removal of abscessed teeth and tonsils has shown no marked effect. The basal metabolic rate is minus fifteen.

DELL T. LUNDQUIST, M.D., Palo Alto, Calif.

ANSWER.—It is noted that the stools of the patient under consideration are described as containing abundant clumps of oval yeast, with a few associated pus cells. Since no report on the cultures of the stools is given it cannot be determined whether the fungus mentioned is a true yeast or a Monilia. Relative to the latter, P. M. Keating (Fungus Infection of Bone and Joint, *South. M. J.* **2**:1072) reported twenty-five cases of Monilia infections of the bone and joint, of which eight cases were classed under chronic atrophic arthritis. These patients showed a heavy growth of Monilia in the intestine and throat. They also gave positive blood agglutinations and were sensitive to intradermal tests for Monilia. The treatment described was iodides, neoarsphenamine, specific vaccine and diet.

Nye, Zerfas and Cornwall (The Pathogenicity of Yeastlike Fungi Isolated from the Human Gastro-Intestinal Tract, *Am. J. M. Sc.* **178**:515 [Oct.] 1929) investigated the pathogenicity of yeast isolated from the stools of normal individuals and with patients with various diseases. Many of the yeasts isolated were found to be pathogenic to laboratory animals.

SUCTION AND SIPHONAGE IN SINUS DISEASE

To the Editor:—Regarding the popular practice of applying suction and siphonage (nasal) as a means of draining the various sinuses, am I correct when I maintain that it is mechanically impossible to obtain such desirable results in that way? My contention is that the developed negative pressure is equal opposite all the sinus openings, and that therefore there can be no movement of the contained fluid, and that the only way in which retained secretion can be removed requires the entrance of a tube into one of the openings, followed by suction or pressure. Am I correct in this? If printed in THE JOURNAL, kindly omit name.

M.D., New York.

ANSWER.—It is in all likelihood true that the popular practice of applying suction and nasal siphonage as a means of draining the various sinuses is only partly, if at all, successful in accomplishing this purpose. The most rational and successful methods depend on the insertion of a trocar or blunt cannula into the cavity in question and then using suction, irrigation or, rarely, pressure. This is not to say, however, that the proper use of suction and siphonage is not a helpful procedure. Even though the secretions removed are those which have already left the sinuses and are present in the nasal cavity, there is some depletion of the tissues following the use of warm solutions, especially if these are hypotonic, and there is often a great deal of comfort to be obtained in the free breathing that follows the cleansing of the nasal passages. Some of the solution used may actually enter the sinuses, but not with any degree of force. After puncture and lavage of such a cavity as the antrum of Highmore, it is not uncommon to find a silver stained secretion when the patient has been using mild silver protein.

EFFECTS OF INHALING SULPHUR DIOXIDE

To the Editor:—Can inhalation of sulphur dioxide or other gas used in electrical refrigeration, in sufficient quantity, result in anemia? Are there records of such cases being actually checked prior to such inhalation and following it?

M. J. STONE, M.D., Bronx, N. Y.

ANSWER.—From the action of sulphur dioxide or other commonly used refrigerator gases, an anemia is not expectable. The effects of sulphur dioxide are essentially but not exclusively local and chiefly are represented by inflammation along the respiratory tract. However, some systemic effects are possible under conditions of either severe or moderate involvement, such for example as the consequences attending increased acidity of the body. Under two circumstances an anemia may arise after exposure to sulphur dioxide. The first of these is connected with direful poisoning. The hemoglobin quickly is changed through decomposition to hematin. Such a condition has been discussed in Peterson, Haine and Webster's "Legal Medicine and Toxicology." This, however, is more often associated with fatal cases and the brief time involved scarcely permits of the use of the term "anemia." The second possibility grows out of the fact that a respiratory infection may be associated with more moderate poisoning by sulphur dioxide and, as the result of infection rather than as a direct result, anemia may take place. In short, anemia is a possible but not a characteristic result from sulphur dioxide in particular or from any known much used household chemical refrigerant.

PREGNANCY AND ALLERGIC PHENOMENA

To the Editor:—I have just delivered a quadripara of twins and would appreciate a scientific explanation of the following unusual condition: There is nothing unusual in the condition of the mother except for a hypertension of 160 systolic, 84 diastolic. The Wassermann reaction is negative, and examination of the urine is negative. The unusual feature is the presence of an urticarial dermatitis, itching in character, with raised surfaces, occurring just after delivery of the placenta. This condition persists till the onset of a following pregnancy. The patient has had this condition following her first delivery up to the present date. As a matter of fact she realized that she was pregnant when the urticarial condition cleared up. Can it be possible that a placental or ovarian hormone deficiency after pregnancy causes this condition? The patient had no disturbance of the skin prior to her first pregnancy.

JACOB GOLDBERG, M.D., Long Branch, N. J.

ANSWER.—The history here related is not at all uncommon: disappearance of urticaria and pruritus at the onset of pregnancy, with recurrence after the termination of labor. There are many possible explanations.

The correspondent says nothing about the menstrual history of the patient. This, together with investigations as to the hormone content (estrogenic and gonadotropic principles) of the blood and urine in different parts of the menstrual cycle may give some clue as to a hormone deficiency, if such exists. It may be that the patient has a normal hormone balance but that an intercurrent allergic condition exists, the cutaneous manifestations of which were relieved by the increased level of estrogenic and/or gonadotropic substances (or even some unknown factor) in the blood stream during pregnancy. It does not follow that therapy with either of these principles would be safe or effective in the interim between pregnancies and obviously, even if effective, it would have to be kept up indefinitely. The possible effects of such therapy on the menstrual cycle must also be considered. The usual efforts should be made to trace in the environment an inciting factor of the urticaria, such as a food to which the patient may be sensitive.

TRIBROM-ETHANOL ANESTHESIA NOT RECOMMENDED FOR TONSILLECTOMY

To the Editor:—Will you kindly inform me whether it is safe to administer tribrom-ethanol in the removal of tonsils and adenoids when this work is performed in the physician's office? May this drug be administered to children? If yes, are there any special precautions to be taken? Kindly omit name.

M.D., Connecticut.

ANSWER.—It is not wise and frequently is actually unsafe to administer tribrom-ethanol in the removal of tonsils and adenoids when this work is performed either in the physician's office or even in a hospital. There are other better and safer anesthetics for this purpose, ether, to mention one of them, being much preferable. Patients frequently do not awake from tribrom-ethanol for hours. This is an undesirable situation when there is a good deal of secretion in the pharynx or vomitus, or when there may be bleeding such as follows from time to time after a tonsil and adenoid operation. The laryngeal cough reflex disappears late under tribrom-ethanol anesthesia and returns late, and it is this laryngeal cough which is the "watch-dog," in Jackson's terminology, of the lungs. Blood and secretion in the pharynx, when the laryngeal cough reflex is absent for periods of time, may enter the lungs and produce serious complications.

The drug may be administered to children in proper doses as it is to adults. Here, too, the same restrictions as to the presence of secretion or blood in the pharynx hold.

LOCALIZED PERSPIRATION

To the Editor:—A medical man, aged 42, complains of continuous sweating on the left side of the forehead and left side of the nose only for the last month. The family history reveals nothing in particular. The patient has no outstanding habits. He was passing small quantities of sugar in the urine about a year ago for a short time, but there has been none since. The blood sugar is otherwise normal. The dextrose tolerance test reads 0.14 mg. of sugar. Physical examination of the digestive, respiratory and circulatory systems was normal; the pulse was 82; the blood pressure 125 systolic, 80 diastolic; the urinary system normal, without albumin or sugar; the nervous system normal, without subjective complaint; the eyes normal (fundi); no wasting of any muscles; no tremors; the reflexes all normal; cutaneous sensations normal. Except for the present subjective complaint of constant perspiration on the left side of the forehead and on the left side of the nose, the patient has no trouble. Please advise me of the probable cause of this condition and how to proceed with the case. Kindly omit name.

M.D., India.

ANSWER.—The probable cause of the localized sweating in this case is an irritation of the sympathetic chain in the cervical or upper thoracic regions on the left side. A dilatation of the pupil of the eye on that side would be confirmatory. One of the commonest causes for this condition is an aneurysm of the arch of the aorta. However, any tumor in that region may be the etiologic agent.

HYPERHIDROSIS

To the Editor:—What treatment is suggested in a case of generalized hyperhidrosis of ten years' duration in a woman, aged 69, who has had a good health record? At present she is showing some myocardial changes with associated dyspnea, bronchitis and hypertension. Examination of the urine gives negative results. Sweating occurs winter and summer, day and night. It is not offensive but keeps the patient's underclothing saturated most of the time. Local applications are not effectual. Please discuss etiology also. Kindly omit name.

M.D., Maryland.

ANSWER.—Hyperhidrosis is a functional disturbance of the sweat secretion, which is regulated by the vegetative nervous system. According to some modern physiologists there are two mechanisms involved, one of parasympathetic origin produced by thermic stimulation, and the other of sympathetic origin associated with psychic disturbances. In an elderly woman in whom tuberculosis can be excluded, the etiology may not be an organic condition and it may be purely nervous in origin. Treatment will give only partial relief. Permanganate baths may be tried. Atropine internally is of temporary benefit. The dosage should not exceed 0.001 Gm.

KAHN TEST IN PSORIASIS

To the Editor:—I should like to know whether a positive Kahn reaction exists in psoriasis? N. L. MISTACHKIN, M.D., St. Louis.

ANSWER.—There is no indication in the literature that the Kahn test gives positive reactions in the absence of syphilis, in cases of psoriasis. Keim and Kahn (*J. Lab. & Clin. Med.* **10**:1013 [Sept.] 1925), in a study of the specificity of the Kahn test in nonsyphilitic conditions, list thirty-three cases of psoriasis in which the Kahn reactions were negative. Among the cases of psoriasis included in the serologic conferences of the League of Nations Health Committee (Reports of Second Laboratory Conference and of the Montevideo Conference on Serodiagnosis of Syphilis, Geneva, League of Nations Health Organization, 1928 and 1931) Kahn reported one doubtful (±) reaction in a patient free from syphilis. It would appear that the specificity of the Kahn test is not affected by psoriasis. It is well, however, to be duly guarded in interpreting positive serologic results in the presence of pathologic conditions other than syphilis. This applies to all methods.

TABES WITH OPTIC ATROPHY

To the Editor:—A man in his early fifties has been sent to me for treatment because of unilateral optic atrophy. He presents all the classic signs and symptoms of tabes, his blood is 4 plus, and he gives a history of an early lesion for which he states he received one injection of arsphenamine about twenty-five years ago. Would you kindly outline what is considered the latest method of proceeding with the treatment of such a case? What is the present thought about weekly spinal drainage in these cases? What is the place of the different metals here, and what form of arsenic is indicated? Please omit name. M.D., Connecticut.

ANSWER.—Neither the "latest" nor older methods can be expected to give any great improvement in such a case. An arrest of the process should be attempted with a return to a negative Wassermann reaction, but no hope of anything more than that should be offered. Mercury or bismuth compounds and potassium iodide in many such cases are as satisfactory as any arsenical. If tryparsamide is used, great care in watching for fundus or field changes in the good eye by weekly tests should be exercised. Weekly spinal drainage is not of proved value.

RECURRENCE OF OSTEOMYELITIS

To the Editor:—Please send me any information you may have regarding the possibility and probability of an osteomyelitis recurring fifteen years after the original infection in the femur. Could such a recurrence be spontaneous? Would a blow to the skin over the site of the original involvement cause a recurrence? M.D., Florida.

ANSWER.—Pyogenic infection in bone may remain latent for many years following an acute osteomyelitis. It is not infrequent that this infection becomes reactivated long after the original disease. The so-called silent foci of osteomyelitis may remain in bone for as long as twenty to thirty years without causing active symptoms and are frequently discovered only by roentgen examination. Activation of such a latent infection is usually without obvious cause, but frequently a history of regional injury is obtained. Undoubtedly, in some cases, injury serves to activate the lesion.

WATER SOLUBLE JELLY INCORPORATING TANNIC ACID

To the Editor:—Would you be kind enough to give me a suitable formula for a water soluble jelly to be used for incorporating tannic acid; also a suitable antiseptic. This preparation is to be used for scalp burns exclusively—for first aid treatment in beauty shops. A similar preparation is Amertan, prepared by Ely Lilly & Co. Would the tannic acid stain gray or blond hair? Please specify what antiseptics would be used that are stainless. MEYER L. NIEDELMAN, M.D., Philadelphia.

ANSWER.—Five per cent tragacanth jelly preserved by the addition of 1:500 salicylic acid can be medicated with 5 per cent tannic acid. While the salicylic acid would be stainless, the tannic acid might darken the hair temporarily.

IPECAC IN COLITIS

To the Editor:—One of my patients has requested that I give my opinion on the use of ipecac in the treatment of mucous colitis. I have never had any experience with the use of ipecac in this way and would much appreciate it if you can give me any light on the subject. M.D., California.

ANSWER.—Probably the good results reported from the use of ipecac in some cases of mucous colitis have been in patients who had an unrecognized amebic infection. In nonamebic cases of colitis there is no indication for the use of ipecac.

Medical Examinations and Licensure

COMING EXAMINATIONS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOGY: *Written (Group B candidates).* The examination will be held in various cities throughout the country, April 29. *Oral (Group A and Group B candidates).* New York, June 10. Sec., Dr. C. Guy Lane, 416 Marlborough St., Boston.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written (Group B candidates).* The examination will be held in various cities of the United States and Canada, March 23. *Final oral and clinical examination (Group A and Group B candidates).* Atlantic City, N. J., June 10-11. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: Philadelphia, June 8, and New York, June 10. *Applications must be filed before April 10.* Sec., Dr. William H. Wilder, 122 S. Michigan Blvd., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: New York, June 8. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PEDIATRICS: Atlantic City, N. J., June 10, and St. Louis, Nov. 19. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: Philadelphia, June 7-8. Sec., Dr. Walter Freeman, 1726 Eye St. N.W., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: San Francisco, May 10-12, and Atlantic City, N. J., June 8-10. Sec., Dr. Byrl R. Kirklin, Mayo Clinic, Rochester, Minn.

ARIZONA: *Basic Science.* Tucson, March 19. Sec., Dr. Robert L. Nugent, Science Hall, University of Arizona, Tucson. *Medical.* Phoenix, April 2-3. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

COLORADO: Denver, April 3. Sec., Dr. Wm. Whitridge Williams, 422 State Office Bldg., Denver.

CONNECTICUT: *Endorsement.* Hartford, March 26. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden.

IDAHO: Boise, April 2. Commissioner of Law Enforcement, Hon. Emmitt Pfost, 203 State House, Boise.

ILLINOIS: Chicago, April 9-11. Superintendent of Registration, Department of Registration and Education, Mr. Eugene R. Schwartz, Springfield.

MINNESOTA: *Basic Science.* Minneapolis, April 2-3. Sec., Dr. J. Charnley McKinley, 126 Millard Hall, University of Minnesota, Minneapolis. *Medical.* Minneapolis, April 16-18. Sec., Dr. E. J. Engberg, 350 St. Peter St., St. Paul.

MONTANA: Helena, April 2. Sec., Dr. S. A. Cooney, 7 W. 6th Ave., Helena.

NATIONAL BOARD OF MEDICAL EXAMINERS: The examination will be held in all centers where there are Class A medical schools and five or more candidates desiring to take the examination, June 24-26. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

NEW MEXICO: Santa Fe, April 8-9. Sec., Dr. P. G. Cornish Jr., 221 W. Central Ave., Albuquerque.

RHODE ISLAND: Providence, April 4-5. Dir., Public Health Commission, Dr. Lester A. Round, 319 State Office Bldg., Providence.

TENNESSEE: Memphis, March 25-26. Sec., Dr. H. W. Qualls, 130 Madison Ave., Memphis.

WEST VIRGINIA: Charleston, March 18. State Health Commissioner, Dr. Arthur E. McClue, Charleston.

Idaho October Examination

Hon. Emmitt Pfost, Commissioner of Law Enforcement, reports the oral and written examination held in Boise, Oct. 2-3, 1934. The examination covered 13 subjects and included 130 questions. An average of 75 per cent was required to pass. Seven candidates were examined, all of whom passed. Fourteen physicians were licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists		(1934)	80
University of California Medical School		(1934)	92
Northwestern University Medical School		(1934)	80
State University of Iowa College of Medicine		(1933)	77
University of Nebraska College of Medicine		(1933)	77
University of Pennsylvania School of Medicine		(1933)	87
University of Alberta Faculty of Medicine		(1932)	83

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Northwestern University Medical School		(1934)	N. B. M. Ex., Washington
Rush Medical College		(1933)	N. B. M. Ex.
State University of Iowa College of Medicine		(1929)	Iowa
University of Louisville School of Medicine		(1932)	Kentucky
College of Physicians and Surgeons, Boston		(1911)	Georgia
University of Michigan Medical School		(1932)	California
Washington University School of Medicine		(1932)	Missouri
Creighton University School of Medicine		(1929)	Nebraska, (1931) Louisiana
University of Oregon Medical School		(1930), (1931)	Oregon
Jefferson Medical College of Philadelphia		(1930)	N. B. M. Ex.
University of Wisconsin Medical School		(1931)	Wisconsin

Puerto Rico September Examination

Dr. Ramón M. Suarez, acting secretary, Board of Medical Examiners of Puerto Rico, reports the written and practical examination held in San Juan, Sept. 11-15, 1934. The examination covered 17 subjects and included 80 questions. An average of 75 per cent was required to pass. Ten candidates

were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
George Washington University School of Medicine		(1934)	84
University of Maryland School of Medicine and College of Physicians and Surgeons		(1933)	84.7, 85.1
St. Louis University School of Medicine		(1934)	80.8, 84.3
Jefferson Medical College of Philadelphia		(1934)	84.8
Medical College of Virginia		(1934)	83, 85.4
Université de Paris Faculté de Médecine		(1934)*	80.3
Universidad Central de España Facultad de Medicina, Madrid		(1933)*	78

Two physicians were licensed by reciprocity and 2 physicians were licensed by endorsement from September 5 to October 18. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Louisville School of Medicine		(1933)	New York
New York University, University and Bellevue Hospital Medical College		(1928)	New York

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Georgetown University School of Medicine		(1933)	N. B. M. Ex.
Jefferson Medical College of Philadelphia		(1931)	N. B. M. Ex.

* Verification of graduation in process.

Book Notices

The Biology of the Individual: An Investigation of the Most Recent Advances. The Proceedings of the Association, New York, December 28th and 29th, 1933. Editorial Board: J. Ramsay Hunt, M.D., Thomas K. Davis, M.D., and Angus M. Frantz, M.D. Association for Research in Nervous and Mental Disease. Vol. XIV of a Series of Research Publications. Cloth. Price, $6. Pp. 323, with 49 illustrations. Baltimore: Williams & Wilkins Company, 1934.

This volume is a compilation of the proceedings of the fourteenth annual meeting of the Association for Research in Nervous and Mental Disease. The papers have been published in full, together with questions and answers as submitted by the commission and members of the association. The first half of the book contains papers on the fundamental factors of heredity, growth, environment and various problems of constitution. This section is particularly instructive and includes such acknowledged masters in their respective fields as Smith Ely Jelliffe, on historical notes on constitution and individuality; C. R. Davenport, on body build and its inheritance; William James, on morphologic form and its relation to reflex action and behavior; T. Wingate Todd, on the progress of physical maturity and mental expansion in childhood; Arnold Gesell, on the ontogenetic patterning of infant behavior; Lewellys Barker, on constitution and internal medicine; Walter Timme, on endocrine aspects of constitution; Max Goldzieher, on biochemical aspects of constitution, and Eugene Kahn, on constitutional aspects of personality types. The second part is concerned with psychologic and sociological aspects of behavior. While these studies have a special appeal to neurologists and psychiatrists, they can be profitably read by every physician desiring to ground himself in those factors which go to make up the biologic totality of the individual. The association has made a distinct contribution to medical literature in making these papers available in book form.

Lungentuberkulose und Schwangerschaft. Von H. Braeuning, Chefarzt der Fürsorgestelle für Lungenkranke in Stettin. Paper. Price, 24 marks. Pp. 275, with 391 illustrations. Leipzig: Georg Thieme, 1935.

The author sets down and draws conclusions from the histories of 215 women suffering from tuberculosis. They had 237 pregnancies (three twins), forty-one miscarriages, seven premature labors, sixty-one therapeutic abortions (of which one abdominal pregnancy and one defundectomy) and there were fourteen cases of pregnancy with tuberculosis before the end of the sixth month, a total of 360 pregnancies. After quoting numerous authorities on both sides of the controversy as to whether pregnancy does or does not aggravate tuberculosis and whether therefore the combination does or does not indicate therapeutic abortion, he enumerates the difficulties in collecting and evaluating such material. He describes a scheme for registering graphically conditions, roentgen observations (pencil sketches), history and result, which helps to the understanding of the details of each case quickly. The histories of the 215 women are given quite fully and his own conclusions are briefly stated at the end of each recital. A careful perusal of many of his case reports permits different conclusions from those arrived at by the author but the reader suffers from the great disadvantage of not having seen and examined and followed the patient, wherefore his deductions are less valuable.

In answer to the question of the effect of pregnancy on the tuberculosis, he says that undoubtedly a bad effect is determinable but that it is not nearly so frequent as has been believed. In answer to the question Which forms of tuberculosis, inactive, active closed, open, are aggravated and in what age? he says that his figures are too few to decide; but it does seem that in young phthisical patients marked augmentation of the severity more often occurs. The answer to the query for the fate of advanced tuberculous patients seems to be more certain: they run less danger than the beginners, because in the latter a curable disease may be made incurable through pregnancy. In the former, pregnancy does not always aggravate the disease. His studies do not permit foretelling in a given case whether pregnancy will or will not act evilly.

The favorable results of treatment are stressed, and the routine roentgen examination of the chest of all pregnant women is advocated. The discussion of therapeutic abortion is clear, both sides being presented, the author admitting that the indication often rests on the doctor's world politics, his operative urgings or his sense of responsibility to either patient, the question at present being a live one in Germany, where increase of population is wanted on ethical and political grounds. Abortion is not done in inactive tuberculosis and in hopeless cases. In young women with active curable phthisis, abortion is done in the first three or four months. Sterilization, the fate of the child, its nursing and other aspects of the complicated situation are given clarifying consideration. This is a valuable addition to the library—already immense—on the subject of tuberculosis in pregnancy.

An Atlas of the Commoner Skin Diseases. By Henry C. G. Semon, M.A., M.D., M.R.C.P., Physician for Diseases of the Skin, Royal Northern Hospital. Photography under the direction of Arnold Moritz, B.A., M.B., B.C. Cloth. Price, $12. Pp. 221, with 103 illustrations. Baltimore: William Wood & Company, 1934.

A new atlas comprising 103 plates reproduced by direct color photography from the living subject should prove of great interest to students of dermatology. The photography, under the direction of Arnold Moritz, has been beautifully done. The reproductions are vivid, lifelike portrayals and far superior to those found in most atlases, which have been reproduced from moulages. In a few pictures there has been some slight deviation from the natural colors. In most plates the color values have been faithfully recorded. The cases selected by Semon have been those seen in everyday routine office practice. The accompanying descriptions are brief but contain many valuable diagnostic and therapeutic hints. The author and publisher are to be congratulated on this valuable contribution to dermatologic literature.

Die Variabilität der Organismen und ihre Normgrenzen zugleich ein kurzer Leitfaden der Variationsstatistik. Von Dr. Hans Günther, Professor an der Universität Leipzig. Paper. Price, 7 marks. Pp. 132, with 12 illustrations. Leipzig: Georg Thieme, 1935.

Morphologic, physiologic and organismal differences are observable between individuals of a species and in a given individual at different times. Of these some are directly measurable, others as yet are not. Notwithstanding these differences, a uniformity prevails that permits the identification of the individual or species. The differences occur, therefore, within limits that it is necessary to recognize. Also a variation beyond certain limits leads to the concepts of normality and disease. The problem of determining the boundaries of normal variation thus becomes of importance from the standpoint of clinical medicine. The author has endeavored to deal with this interesting and significant problem. The causes and categories of variability are described. The statistical methods that permit an analysis of the measurable characters are expounded and their use is exemplified. The determination of "normal" limits is especially emphasized. Disease as a problem of variability is given a chapter. The bearing of biologic

variables on the concept of "constitution" is discussed. The book is thus of interest to biologists as well as to clinicians. The extent and diversity of the appended bibliography reveal the wide scope of the views presented and their associations and implications.

Standard Classified Nomenclature of Disease. Compiled by the National Conference on Nomenclature of Disease. Edited by H. B. Logie, M.D., C.M., Executive Secretary. Second edition. Fabrikoid. Price, $3.50. Pp. 870. New York: The Commonwealth Fund, 1935.

This nomenclature is now in use in some five hundred hospitals of the United States and Canada. In the preparation of the second edition, advice and suggestions have been received from numerous organizations and institutions that have aided in the development of the work and in its application. The standardization of language is a most useful step toward better study of morbidity and mortality. The volume is excellently printed on thin paper and should be made available to record clerks everywhere.

Veröffentlichungen aus der Gewerbe- und Konstitutionspathologie. Herausgegeben von L. Aschoff, M. B. Schmidt, M. Borst und L. Pick. Geleitet von W. Koch. Heft 37, Band VIII—(Schluss-) Heft 5. Kraftverkehr und Volksgesundheit: Gibt es chronische Autoabgasschäden? Experimentelle Untersuchungen am Benzinmotor. Von M. Schmidtmann. Paper. Price, 4.50 marks. Pp. 44, with 5 illustrations. Jena: Gustav Fischer, 1934.

This study of motor traffic and public health and the question whether there are chronic ill effects from exhaust gas is based on observations chiefly on animals exposed to volatilized German motor fuel (benzine) and the exhaust from motors consuming that fuel. German motor fuel generally consists not merely of gasoline from petroleum but contains also considerable amounts of coal distillate; and coal distillate is rich in benzene and related substances. This study is accordingly concerned less with carbon monoxide asphyxia than with benzene poisoning. In the air of streets the author finds that no considerable hazard to health arises either from carbon monoxide or from benzene. Nor is exhaust gas responsible, according to the author, for the increasing occurrence of cancer of the bronchi. Exhaust gas in such dilution as occurs outdoors causes no injury to the lungs. Experiments are, however, reported which afford evidence that the blood-forming organs may be affected and anemia induced by chronic exposure to appreciable amounts of exhaust gas from German motor fuel.

A College Textbook of Hygiene. By Dean Franklin Smiley, A.B., M.D., Medical Adviser and Professor of Hygiene in Cornell University, and Adrian Gordon Gould, Ph.B., M.D., Assistant Medical Adviser and Assistant Professor of Hygiene in Cornell University. Second edition. Cloth. Price, $2. Pp. 383, with 90 illustrations. New York: Macmillan Company, 1934.

This is a revised edition of a college book of hygiene that met a most favorable reception on its first appearance. Its authors are experienced in their field and have therefore written the book to the needs of the group for whom it is written. The book discusses the causes of disease, the influence of heredity, methods of prevention of disease, the functioning of various systems in the human body, and the proper control of the human body for health.

The New-Born Baby: A Manual for the Use of Midwives and Maternity Nurses. By Eric Pritchard, M.A., M.D., F.R.C.P., Medical Director, Infants Hospital, London. Cloth. Price, 4/6. Pp. 272, with 9 illustrations. London: Henry Kimpton, 1934.

This little manual was intended to serve as a textbook for students of midwifery. It is a series of lectures on the subject of the care of the new-born baby. The author's style is distinctly informal and direct. Facts are concisely presented but correlated with enough interesting detail so that they engage the reader's interest. The management, clothing and feeding of the new-born baby are first considered. Next, prematurely born infants are considered in detail from the standpoint of care and feeding. The minor ailments and common complaints of the new-born are concisely discussed, as are the common diseases of the new-born. While the author reflects the English school of thought, the book is so fundamentally sound in principle that it is well adapted to American instruction. The book will find its greatest field of usefulness among the nursing profession.

Some Notable Epidemics. By H. Harold Scott, M.D., F.R.C.P., D.P.H., Assistant Director, Bureau of Hygiene and Tropical Diseases. With preface by W. W. Jameson, M.A., M.D., F.R.C.P., Professor of Public Health in the University of London. Cloth. Price, $4.75. Pp. 272. Baltimore: William Wood & Company, 1934.

This volume is concerned wholly with epidemics occurring in England from the period 1854 to 1933. The epidemics include outbreaks of cholera, typhoid, diphtheria, scarlet fever, food poisoning and dysentery. In each instance careful analysis is made as to the mode of onset of the epidemic, the case incidence, the tracing of the spread of the disease and similar factors. The volume should be useful to public health officials and a valuable reference work for students in the field of preventive medicine.

Introduction à la chirurgie réparatrice. Par E. E. Lauwers. Préface du Pr. Ombredanne. Paper. Price, 18 francs. Pp. 79. Paris: Masson & Cie, 1934.

The last word of the author, who is a professor at the University of Ghent, is that this is meant to indicate the principles and general application of reparative surgery, leaving the application to those who know how. Professor Ombredanne, who contributes a preface, notes the deliberate absence of surgical technic. The book, therefore, is a painstaking recital of what has been done, and by whom, whether on the body surface, in the cavities or in relation to organs, members or disturbed functions. The work is thorough and, besides being admirably written, constitutes an annotated bibliography, including all the literature that is of high significance up to a certain date. What it may lack in completeness can be set down to the rapid progress that has been made recently. It is a reference work of great value not merely to those who adopt the limited view of the specialty but also to the general surgeon, and it has the merit of being compressed within eighty pages.

Medicolegal

Illegal Sale of Drugs Enjoined.—The Kentucky board of pharmacy, on the relation of the Attorney General, instituted proceedings to enjoin the Ashland Gem Company, Inc., from operating a pharmacy in violation of the Kentucky pharmacy act, alleging that the company was permitting the compounding and dispensing of prescriptions and the vending, at retail, of drugs, medicines, poisons and pharmaceutical preparations by persons who were not registered pharmacists. After all the evidence had been introduced and after the case had been submitted to the court for judgment, the plaintiff sought leave to file an amended petition. The court after rejecting the proffered amended petition enjoined the defendant from "compounding or dispensing prescriptions and from selling at retail, drugs, medicines, poisons or pharmaceutical preparations, . . . except by or in the presence and under the immediate supervision of a registered pharmacist," with the proviso that the injunction should not apply to the selling by the defendant "of the usual non-poisonous domestic remedies, medicines, or of patent or proprietary medicines." The plaintiff, contending that the trial court erred in rejecting the amended petition and in refusing to grant the additional relief sought, appealed to the Court of Appeals of Kentucky.

The amended petition, in effect, requested the court to enjoin the defendant from selling at retail, except by and under the supervision of a registered pharmacist, a number of preparations named in the original petition or any drug, medicine, poison, or pharmaceutical preparation, or any patent or proprietary medicine, domestic remedy, chemical or poison which in and of itself is liable to be dangerous or destructive to adult human life in quantities of 60 grains or less for medicinal use. The purpose of the pharmacy act, said the court, is to protect the health and lives of the public against acts of untrained and incompetent persons in compounding and dispensing medicines. That the legislature may, in the exercise of the police power, enact such regulatory measures is no longer an open or doubtful question. In prescribing what the defendant may not do, said the Supreme Court, in the conduct or operation of its

drug store, except in the presence and under the immediate supervision of a registered pharmacist, the injunction granted by the trial court practically adopted the language of the pharmacy act. This was as broad and comprehensive as the decree could well be made. It would be an endless task for the court to attempt to enumerate the articles which might be properly included within the scope of different sections of the act. If the sale of any of the preparations specified in the amended petition, except by or in the presence of and under the immediate supervision of a registered pharmacist, would be a violation of the statute, then such sale made by the defendant would also be in violation of the injunction. It is therefore apparent, concluded the court, that under the decree the plaintiff, as well as the public generally, is afforded every remedy and protection authorized by the statute. The judgment of the trial court was consequently affirmed.—*Kentucky Board of Pharmacy ex rel. Attorney General v. Ashland Gem Co. (Ky.), 71 S. W. (2d) 1006.*

Dead Bodies: Liability of Undertaker for Unlawful Detention of Body.—An undertaker, over the protest of the surviving wife, held the dead body of her husband and embalmed it without her consent, refusing to deliver the body until his fees were paid. The wife sued the undertaker to recover punitive damages and obtained judgment in the trial court. The undertaker thereupon appealed to the Supreme Court of North Carolina.

The surviving wife, said the Supreme Court, has a property right or quasi-property right in and to the body of her dead husband, which is paramount to the claim of any other person. Moreover, she may recover punitive damages for the mutilation or unlawful detention of the body by a third person if such conduct is wilful, wanton, reckless or unlawful. Manifestly, said the court, the arbitrary withholding of the dead body of her husband from a widow, as a security for a debt, or for services rendered, is an unlawful act, even though courteously done, as the Supreme Court of Washington said in *Gadbury* v. *Bleitz,* 133 Wash. 134, 233 P. 299, 44 A. L. R. 425:

> But we think that the holding of the body after the time for its cremation has passed, and claiming to hold it as a guaranty or as security for the payment of some indebtedness, is making a misuse of the body, just the same as its mutilation or improper burial. The misuse in one case may be greater in degree, but nevertheless it is a misuse.

In the present case the evidence offered by the plaintiff widow tended to show that she, in deep distress from nervous shock, was compelled to wait an hour or two in the dead of the night to haggle and barter for the body of her husband. The Supreme Court concluded that the plaintiff was entitled to recover punitive damages and affirmed the judgment of the trial court.—*Bonaparte v. Fraternal Funeral Home (N. C.), 175 S. E. 137.*

Duty of County to Furnish Surgical Treatment to Prisoner.—A negro prisoner of Lauderdale County, Tennessee, needed surgical attention that was not available locally. He was sent to a hospital owned by the city of Memphis, carrying two letters, one signed by both the sheriff and the county physician, requesting that he be treated, and the other, signed by the sheriff, saying that Lauderdale County would pay for the necessary treatment. Later the city of Memphis brought suit against Lauderdale County and against the sheriff and the county physician, personally, to recover compensation for the treatment rendered. The trial court dismissed the suit against all defendants but the court of appeals of Tennessee, on appeal, rendered a decree in favor of the city against the county. The case was then carried to the Supreme Court of Tennessee.

In Tennessee, said the Supreme Court, the law requires a county physician to attend prisoners in the county jail and to direct or order treatment. So far, however, as the ordered treatment may not be supplied by the county physician, the prisoner is left to his own resources to provide it, in the same manner and degree as if he were not in confinement. A county physician may not bind the county to pay the cost of medical or hospital service rendered by others to a prisoner. There is no obligation on a county to furnish hospital services to a jail prisoner who cannot pay the cost of the service. The court concluded, therefore, that there was no statutory authority for holding the county liable for the services rendered by the hospital to the prisoner. The county physician and the sheriff, continued the Supreme Court, were acting in good faith, believing that the county would be liable for the service they requested for the prisoner. The hospital authorities understood that they were not acting individually in their requests. There was no proof that the hospital authorities were without full knowledge of all the attendant circumstances when they rendered the surgical treatment. When public agents, said the court, contract in good faith with parties having full knowledge of the extent of their authority, or who have equal means of knowledge with themselves, they do not become individually liable unless the intent to incur personal responsibility is clearly expressed. The court concluded, therefore, that there was no individual liability on the sheriff or the county physician to pay for the services.

Judgment was entered in favor of the county and of the sheriff and county physician.—*Lauderdale County v. City of Memphis (Tenn.), 71 S. W. (2d) 686.*

Society Proceedings

COMING MEETINGS

Alabama, Medical Association of the State of, Mobile, April 16-18. Dr. D. L. Cannon, 519 Dexter Avenue, Montgomery, Secretary.

American Association of Anatomists, St. Louis, April 18-20. Dr. George W. Corner, University of Rochester School of Medicine, Rochester, N. Y., Secretary.

American Association of Pathologists and Bacteriologists, New York, April 18-19. Dr. Howard T. Karsner, 2085 Adelbert Road, Cleveland, Secretary.

American Association of the History of Medicine, Atlantic City, May 6. Dr. Edward J. G. Beardsley, 1919 Spruce Street, Philadelphia, Secretary.

American Association on Mental Deficiency, Chicago, April 25-27. Dr. Groves B. Smith, Beverly Farms, Godfrey, Ill., Secretary.

American College of Physicians, Philadelphia, April 29-May 3. Mr. E. R. Loveland, 133 South 36th Street, Philadelphia, Executive Secretary.

American Dermatological Association, White Sulphur Springs, W. Va., May 2-4. Dr. William H. Guy, 500 Penn Avenue, Pittsburgh, Secretary.

American Pediatric Society, Cleveland, May 2-4. Dr. Hugh McCulloch, 325 North Euclid Avenue, St. Louis, Secretary.

American Physiological Society, Detroit, April 10-13. Dr. Frank C. Mann, Mayo Clinic, Rochester, Minn., Secretary.

American Society for Clinical Investigation, Atlantic City, May 8. Dr. H. L. Blumgart, 330 Brookline Avenue, Boston, Secretary.

American Society for Experimental Pathology, Detroit, April 10-13. Dr. Shields Warren, 195 Pilgrim Road, Boston, Secretary.

American Society for Pharmacology and Experimental Therapeutics, Detroit, April 10-13. Dr. E. M. K. Geiling, 710 N. Washington Street, Baltimore, Secretary.

American Society of Biological Chemistry, Detroit, April 10-13. Dr. H. A. Mattill, State University of Iowa, Iowa City, Secretary.

Arizona State Medical Association, Phoenix, April 25-27. Dr. D. F. Harbridge, 15 East Monroe Street, Phoenix, Secretary.

Arkansas Medical Society, Fort Smith, April 15-17. Dr. W. R. Brooksher, 602 Garrison Avenue, Fort Smith, Secretary.

Association of American Physicians, Atlantic City, May 7-8. Dr. James H. Means, Massachusetts General Hospital, Boston, Secretary.

District of Columbia, Medical Society of the, Washington, May 1. Dr. C. B. Conklin, 1718 M Street N.W., Washington, Secretary.

Federation of American Societies for Experimental Biology, Detroit, April 10-13. Dr. H. A. Mattill, State University of Iowa, Iowa City, Secretary.

Georgia, Medical Association of, Atlanta, May 7-10. Dr. Allen H. Bunce, 139 Forrest Avenue N.E., Atlanta, Secretary.

Iowa State Medical Society, Davenport, May 8-10. Dr. Robert L. Parker, 3510 Sixth Avenue, Des Moines, Secretary.

Kansas Medical Society, Salina, May 8-10. Mr. Clarence Munns, Stormont Building, Topeka, Executive Secretary.

Louisiana State Medical Society, New Orleans, April 29-May 1. Dr. P. T. Talbot, 1430 Tulane Avenue, New Orleans, Secretary.

Maryland, Medical and Chirurgical Faculty of, Baltimore, April 23-24. Dr. Walter Dent Wise, 1211 Cathedral Street, Baltimore, Secretary.

Missouri State Medical Association, Excelsior Springs, May 6-9. Dr. E. J. Goodwin, 634 North Grand Boulevard, St. Louis, Secretary.

New Hampshire Medical Society, Manchester, May 7-8. Dr. Carleton R. Metcalf, 5 South State Street, Concord, Secretary.

New Jersey, Medical Society of, Atlantic City, April 30-May 2. Dr. J. B. Morrison, 66 Milford Avenue, Newark, Secretary.

North Carolina, Medical Society of the State of, Pinehurst, May 6-8. Dr. L. B. McBrayer, Southern Pines, Secretary.

South Carolina Medical Association, Florence, April 23-25. Dr. E. A. Hines, Seneca, Secretary.

Tennessee State Medical Association, Nashville, April 9-11. Dr. H. H. Shoulders, 706 Church Street, Nashville, Secretary.

West Virginia State Medical Association, Wheeling, May 6-8. Mr. Joe W. Savage, Public Library Building, Charleston, Executive Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Periodicals are available from 1925 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Anatomy, Philadelphia

56: 1-160 (Jan. 15) 1935. Partial Index

Atrophy and Degeneration in Skeletal Muscle. Sarah S. Tower, Baltimore.—p. 1.

Biologic Effects of Roentgen Rays: Determination of Critical Periods in Mammalian Development with X-Rays. T. T. Job, G. J. Leibold Jr. and H. A. Fitzmaurice, Chicago.—p. 97.

Effect of Experimentally Produced Hyperthyroidism on Reproductive and Associated Organs of the Male Rat. Rose S. Cohen, Cincinnati. —p. 143.

American Journal of Cancer, New York

23: 1-246 (Jan.) 1935

Histologic Classification of Cancers of Uterine Cervix and Relation Between Growth Structure and Results of Radium Treatment. H. Chambers, London, England.—p. 1.

*Malignant Epithelial Tumors of Neck: Carcinoma of Branchiogenic Origin. R. L. Oliver, Baltimore.—p. 16.

Primary Pulmonary Sarcoma: Case Report. E. P. Johns and W. C. Sharpe, London, Ont.—p. 45.

*Studies on Internal Organs of Mice Painted with Carcinogenic Agents. J. M. Twort and C. C. Twort, Manchester, England.—p. 52.

Comparative Pathology of Carcinoma of Pancreas: Report of Two Cases in Mice: Studies in Incidence and Inheritability of Spontaneous Tumors in Mice: Thirty-Third Report. Maud Slye, Harriet F. Holmes and H. G. Wells, Chicago.—p. 81.

Freezing Points of Normal and Neoplastic Tissues and Their Changes During Autolysis. Evelyn Howard, Baltimore.—p. 87.

*Behavior of Rous Tumor Virus to Freezing. J. K. Miller and H. E. Eggers, Omaha.—p. 94.

Tar Epithelioma in Sympathectomized Albino Rabbit. R. B. Raney, Rochester, N. Y.—p. 98.

Suprarenal Tumors. C. F. Geschickter, Baltimore.—p. 104.

Malignant Epithelial Tumors of Neck.—Oliver presents a study of eighty cases of carcinoma arising in the deep tissues of the neck without relation to the epidermis or glandular organs. The ultimate results in relation to the modes of treatment and the types of cellular pathology indicate that these tumors, which are usually fatal (seventy-seven out of eighty cases), are best treated by radical surgery if seen in the earlier stages. They comprise a single pathologic entity grading from the less differentiated basal cell forms through the cuboid cell type to the most highly differentiated squamous cell form. Surgery is slightly more favorable in these last two forms than in the first. Irradiation is probably advisable in conjunction with surgery in all forms, but particularly in the basal cell type. In advanced and inoperable cases, palliative irradiation may be helpful.

Organs of Mice Painted with Carcinogenic Agents.—The Tworts examined the organs of several thousand mice painted with various carcinogenic agents in relation to individual susceptibility to tumor formation. The studies revealed that carcinogenic, therapeutic and other agents may so interfere with the general metabolism of mice that there is a profound influence, direct or indirect, on tumor development. Conversely, the presence of a tumor may so derange metabolism, especially of young animals, that cause and effect may be easily confused. It would appear that, in order to avoid errors in judgment, investigators should have a thorough knowledge of the changes likely to prevail among their animals. The observer should be in a position to discriminate between the direct and the indirect effect of a therapeutic or carcinogenic agent, with in consequence an added value to his experimental results. General debilitation and stimulation are, it would seem, the key processes to bear in mind. It is when these have been gaged accurately as far as possible, and only then, that one is in a position to evaluate changes in specific tissues. The general outcome of the authors' observations is that "balance" is the essential in keeping the animal free from malignant disease, while at the same time the latter supervenes preferentially on a healthy tissue. Additional observations will, they hope, further enlighten them as regards some of the factors responsible for this balance.

Behavior of Rous Tumor Virus to Freezing.—Miller and Eggers found that the filtrate of the Rous tumor maintained its tumor-producing power after rapid freezing and thawing for sixty times, when these experiments were so conducted as to avoid accompanying oxidation. There was no apparent change in its action, as determined by the rate of tumor growth or by the morphology of the tumor, when this procedure was repeated twenty times. With sixty freezings, there were delays in the development of the tumor and marked changes in the morphology of the tumor. The filtrable agent of the Rous tumor displays a resistance to freezing and thawing greater than that exhibited by known living agents, such as bacteria or other cellular organisms. To the extent that this throws light on its nature, it would suggest an unorganized character. However, the possibility that the filtrate may contain organized bodies so minute as to escape the effect of sudden and repeated changes of volume cannot be absolutely precluded.

American Journal of Diseases of Children, Chicago

49: 1-286 (Jan.) 1935

*Cerebral Manifestations Following Acute Otitis Media in Infancy and in Early Childhood, with Particular Reference to Occurrence of Jacksonian Convulsions, Conjugate Deviation of Head and Eyes and Hemiplegia. C. B. Courville and J. M. Nielsen, Los Angeles.—p. 1.

Formation of Character as Observed in the Well Baby Clinic: Preliminary Report. Margaret E. Fries, Katherine Brokaw and V. F. Murray, New York.—p. 28.

Calcium and Phosphorus Content of Offspring After Feeding Vitamin D to the Mother Rat. W. W. Swanson and L. Vivian Iob, Chicago. —p. 43.

Contour of Chest in Children: II. According to Weight and Height. S. A. Weisman, Minneapolis.—p. 47.

Id.: III. Environment. S. A. Weisman, Minneapolis.—p. 52.

Symptomatic Therapy in Malignant Diphtheria. D. C. Darrow and H. Yannet, New Haven, Conn.—p. 60.

Immunization Against Whooping Cough. L. W. Sauer, Evanston, Ill. —p. 69.

Elimination of Milk-Borne Disease. W. C. Davison, Durham, N. C. —p. 72.

*Studies of Phosphorus of Blood: III. Phosphorus Partition in Whole Blood and in Serum and Serum Calcium and Plasma Phosphatase During Healing of Late Rickets. Genevieve Stearns and Edna Warweg, Iowa City.—p. 79.

Use of Pentnucleotide in Measles and in Pertussis. J. G. M. Bullowa, L. W. Smith and T. B. Quigley, New York.—p. 91.

Iodine Content of American Cod Liver Oil. A. D. Holmes, Boston, and R. E. Remington, Charleston, S. C.—p. 94.

Histology of Midolivary Region of the Medulla Oblongata in the New-Born Infant: Observations on Vessels and Cells. Myrtelle M. Canavan, Boston, and F. A. Hemsath, New York.—p. 101.

Respiration in Infancy: I. Method of Studying Rates, Volume and Character of Respiration with Preliminary Report of Results. Jean Deming and A. H. Washburn, Denver.—p. 108.

Incidence of Spina Bifida Occulta in Children With and Without Enuresis. I. W. Karlin, Brooklyn.—p. 125.

Cerebral Manifestations Following Otitis Media.—Courville and Nielsen point out that a characteristic symptom complex is presented in certain cases following an attack of acute otitis media in early life. The onset of jacksonian convulsions, involving particularly the arm and face, often associated with conjugate deviation of the head and eyes and usually followed by weakness or paralysis of the affected members during a febrile state, suggests a vascular lesion of the cerebrum. Wide variation in the length of the clinical course is noted in these cases. In some instances, the patient recovers within a week, while in cases manifesting probably organic changes in the cortex, residual paretic manifestations may persist for months. The vascular pathway of infection is indicated by the abrupt onset of cerebral manifestations. The lesion itself may be toxic, thrombotic or infectious. The toxic lesions are transient. Thrombotic lesions, which result in hemorrhagic softening, may be localized or diffuse. Residual scarring of the cortex probably persists, but if this is slight residual paralysis may not be present. If the lesion is or becomes infected, a diffuse nonpurulent or a localized purulent encephalitis (abscess) results. The symptom complex is a manifestation of the localization of a lesion in the central or parietal area, but it does

not indicate the exact nature of the lesion. A similar clinical picture, dependent on hemorrhage or thrombosis following toxic lesions of the arterial walls, may be secondary to acute infectious diseases.

Phosphorus, Calcium and Phosphatase During Healing of Rickets.—Stearns and Warweg observed the serum calcium, the plasma phosphatase and the phosphorus partition in the whole blood and in the serum during the healing of late rickets in two children and over a period of three years in a child whose rickets had healed without a corresponding rise in the level of inorganic phosphorus of the serum. In active late rickets, the organic acid-soluble or ester fraction of phosphorus is definitely low and rises rapidly on addition of vitamin D to the diet. The rise in the ester phosphorus of the corpuscles was observed before the rise in the inorganic phosphorus of the serum occurred. If the amount of vitamin D given is insufficient for rapid healing, the increased level of ester phosphorus may not be maintained. The readily hydrolyzable (ten minute) fraction of the ester phosphorus was not significantly altered from the normal in one patient during the period of active rickets. The level of plasma phosphatase was increased in the blood of both children with active rickets. The values tended to decrease as healing progressed but was still far above normal when roentgenologic healing was complete. In one patient the plasma phosphatase was still double the normal value a year after healing was complete. Roentgenologic evidence of healing was observed in one child before any rise in the level of inorganic phosphorus occurred. The ester phosphorus at this time was still below the normal level but well above the level noted at the first observation.

American Journal of Medical Sciences, Philadelphia

189: 1-156 (Jan.) 1935

Stresses and Strains of Homeostasis. W. B. Cannon, Boston.—p. 1.
The Relation of Dentistry to Medicine. L. M. S. Miner, Boston.—p. 15.
*Determination of Phagocytic Power of Whole Blood or Plasma-Leukocyte Mixtures for Clinical or Experimental Purposes: Description of Improved Method, with Representative Findings. F. Boerner and S. Mudd, Philadelphia.—p. 22.
Effect of Tissue Extracts on Muscle Pains of Ischemic Origin (Intermittent Claudication). N. W. Barker, G. E. Brown and Grace M. Roth, Rochester, Minn.—p. 36.
Study of Sputum in Pulmonary Asbestosis. R. C. Page, Philadelphia.—p. 44.
Acetyl-β-Methylcholin (Mecholin): Observations Concerning Its Action on Blood Pressure, Skin Temperature and Heart, as Exhibited by Electrocardiogram of Hypertensive Patients. I. H. Page, New York.—p. 55.
*So-Called Hemorrhagic Encephalitis and Myelitis Secondary to Intravenous Arsphenamines: Based on Review of One Hundred and Fifty-Eight Cases. M. A. Glaser, C. P. Imerman and S. W. Imerman, Los Angeles.—p. 64.
*Spontaneous Rupture of the Esophagus in Syphilis. W. E. Glass and W. Freeman, Worcester, Mass.—p. 80.
Obesity Treatment by Diet, Thyroid and Dinitrophenol: Result on One Hundred and Six Outpatients. Leona M. Bayer and H. Gray, San Francisco.—p. 86.
Clinical Application of Polyvalent Staphylococcus Bacteriophage in Bronchoscopy: Preliminary Report. W. F. Moore and J. W. Love, Philadelphia.—p. 91.
Foreign Protein Therapy: I. Hemocytologic Changes Following Intravenous Injection of Killed Typhoid, Paratyphoid A and Paratyphoid B Bacilli. H. F. Hunt, C. E. Ervin and J. S. Niles, Danville, Pa.—p. 95.
*Standardized Technic for Blood Sedimentation Test. M. M. Wintrobe and J. W. Landsberg, Baltimore.—p. 102.
Macrocytic Anemia and Hepatic Cirrhosis. D. O. Wright, New Orleans.—p. 115.
Intrapleural Pressure in Artificial Pneumothorax During Pregnancy and Childbirth. J. J. Lloyd and E. K. Richard, Rochester, N. Y.—p. 119.

Phagocytic Power of Whole Blood.—Boerner and Mudd submit a method for direct determination of the phagocytic power of whole blood or plasma-leukocyte mixtures. The following features are embodied to eliminate sources of error in current methods: (1) replacement by heparin of anticoagulants that combine with calcium, (2) a technic for collecting leukocytes from small samples of blood with a minimum of manipulation, (3) provision of an agitator to provide continuous mixing of phagocytes and test objects, and (4) determination of percentage phagocytosis as a function of time. Examples are given of the application of this method to a variety of problems; e. g., titration of the phagocytosis promoting action of therapeutic serum, detection of antibodies following infection or vaccination, the relative resistance to phagocytosis of different bacterial strains, and inhibition of phagocytosis by soluble bacterial products. The blood of a patient with eosinophilia examined by this method showed phagocytosis by eosinophils, which was, however, quantitatively inferior to that by neutrophils in the same blood. The opsonization of human erythrocytes by human serums of incompatible types, described by Schiff, has been confirmed. Intracellular lysis and digestion of ingested erythrocytes has been observed. The reliability and significance of results obtained with the blood of dogs during the course of experimental pneumococcic infections are examined statistically.

Encephalitis and Myelitis Secondary to Arsphenamine Therapy.—Glaser and his associates point out that the mortality of cases with central nervous system involvement secondary to intravenous injection of arsphenamine is about 76 per cent. He says there is about one death due to central nervous system involvement in every 5,398 cases treated and in every 28,768 injections. The term "hemorrhagic encephalitis" is not adequately descriptive. The toxic reaction may occur in nonsyphilitic cases and is not related to the quantity of the drug given, to the number of injections, to the toxicity of the drug itself, to the age of the patient or to the sex. It occurs most frequently after the second dose, though it has been reported as occurring after the fifteenth dose. Cases have been reported in which the drug has not at first produced toxic effects but when again given several years later toxic reactions resulted. The symptoms may occur from twelve hours to seventy days after the injection but usually develop in from twelve to 144 hours. The principal symptoms are headache, vomiting, nervousness, chills and dizziness, with physical signs of fever, cyanosis, and respiratory and pulse changes. The principal neurologic signs are convulsions, unconsciousness, pupillary and ocular muscle changes, reflex changes, loss of sphincter control, mental disturbances, hemiparesis and rigidity of the neck. Myelitis and encephalomyelitis may also occur, while meningitis may coexist. This toxic reaction is diffuse rather than focal, as pathologic reports and clinical observations indicate involvement of the other organs. The clinical diagnosis is derived from the organ indicating the greatest involvement: if the brain shows predominating clinical signs, it is an encephalitis; if it is the cord, it is myelitis; if the liver, a hepatitis. The curative measures are detoxification and reduction of intracranial pressure by medical or surgical methods.

Spontaneous Rupture of Esophagus in Syphilis.—In 436 consecutive necropsies performed, forty-four were on patients with syphilitic central nervous system involvement, five of whom, Glass and Freeman state, died during "paretic seizures." Of the latter, two patients died of hemorrhage resulting from complete nontraumatic rupture of the esophageal wall. In no instance were lacerations without complete rupture found. In the first case it was demonstrated that syphilis caused the periarteritis in the esophageal wall. It is logical to assume that these lesions materially weakened the wall. Attacks of retching such as are present in paretic seizures cause extremes of intra-abdominal pressure, which are easily transmitted through the diaphragm to the wall of the esophagus. The regurgitation of autolytic gastric contents over the lining of the esophagus that has been already damaged by the syphilitic reaction tends to erode it, allowing these contents to come in contact with the muscular layers. To substantiate this hypothesis, the epithelial lining round the rent in both specimens was almost completely denuded. In both instances there was a weakened esophageal wall being acted on by autolytic enzymes and severe intra-abdominal pressure, forming an ideal point of rupture. The authors urge a routine, detailed examination of this organ in all necropsies. The esophagus is more vulnerable to pathologic lesions than the statistics have heretofore indicated.

Standardized Technic for Blood Sedimentation Test.—Wintrobe and Landsberg recommend the use of a special hematocrit for the determination of the sedimentation rate because the same instrument can be used subsequently for the measurement of the volume of packed red cells, the volume of packed white cells and platelets, and the icterus index. The determination of the volume of packed red cells is especially

valuable, because by this means the sedimentation rate may be corrected for alterations due to anemia. The following appears to them to be an accurate method of procedure: with a dry syringe and needle, 5 cc. of venous blood is collected and mixed in a small bottle containing 4 mg. of solid potassium oxalate and 6 mg. of solid ammonium oxalate. The blood should be used for the determination of sedimentation rate within four hours. The hematocrit is filled to the 10 cm. mark with blood. The upper level of sedimenting corpuscles may be read at frequent intervals or, more simply, a single reading may be made at the end of one hour. Since the sedimentation rate increases with increasing temperature, the sedimentation test should be carried out at a temperature of not less than 22 nor greater than 27 C. The hematocrit should be kept in an exact vertical position during the sedimentation of the blood corpuscles, for, when the instrument stands at an angle of even 3 degrees from the vertical, significant acceleration of sedimentation takes place. After the sedimentation rate has been determined, the hematocrit containing the blood should be centrifugated and the volume of packed red cells determined. The sedimentation rate may then be corrected for alterations due to anemia. The average sedimentation at the end of one hour has been found to be 3.7 mm. in healthy men and 9.6 mm. in normal women. In 86 per cent of the men examined the sedimentation rate ranged from 0 to 6.5 mm., whereas in the same proportion of women the sedimentation rate ranged from 0 to 15 mm. In an additional 9 per cent the sedimentation rate ranged as high as 9 mm. in men and 20 mm. in women. These values probably represent the extreme range of normal variation under the foregoing conditions.

American Journal of Physiology, Baltimore

110: 513-724 (Jan. 1) 1935

Observations on Innervation of Carotid Sinuses and Section of Depressor Nerves as Method of Producing Arterial Hypertension. M. F. Green, A. F. Degroat and C. H. McDonald, Little Rock, Ark. —p. 513.

Degree of Constancy in Human Basal Metabolism. F. G. Benedict, Boston.—p. 521.

Study of Oxidation That Occurs in Dog After Ingestion of Galactose. J. H. Roe, A. Gilman and G. R. Cowgill.—p. 531.

Gaseous Metabolism of Frog Kidney. F. O. Schmitt, Ruth Sidebotham Kerr and E. D. Bueker, St. Louis.—p. 539.

Results of Feeding Lecithin and Pancreas in Depancreatized Dogs on Liver Fat and Its Saponifiable and Unsaponifiable Fractions. Elaine P. Ralli, G. Flaum and R. Banta, New York.—p. 545.

Variability of H/T Ratio in Twitch of Isolated Skeletal Muscle and Proof of Validity of Method Used for Measuring Heat Production. C. D. Snyder, Baltimore.—p. 552.

Effect of Oxygen on Man at Pressures from 1 to 4 Atmospheres. A. R. Behnke, F. S. Johnson, J. R. Poppen and E. P. Motley, Boston. —p. 565.

Tyrosine Content of Tissues After Intravenous Injection. F. B. King, R. Simonds and M. Aisner, Boston.—p. 573.

Methylene Blue and Anoxemia. G. Crisler, Morgantown, W. Va. —p. 580.

Effects of Thyroparathyroidectomy and Carbohydrate Intake on Action of Anterior Pituitary Extracts. O. H. Gaebler, Detroit.—p. 584.

Theelin Content of Pregnancy Urine and Placenta of the Chimpanzee. E. Allen, A. W. Diddle and J. H. Elder, New Haven, Conn.—p. 593.

Aschheim-Zondek Diagnosis of Pregnancy in the Chimpanzee. S. Zuckerman, New Haven, Conn.—p. 597.

Studies on Depressor Cardiac Reflex After Vagotomy. W. F. Allen, Portland, Ore.—p. 602.

Blood Picture, Reproduction, and General Condition During Daily Exposure to Illuminating Gas. Isabella R. Williams and Erma Smith, Ames, Iowa.—p. 611.

Effect of Increased Air Pressure on Vital Capacity, Expiratory Force and Breath Holding Ability. C. W. Shilling, R. A. Hansen and J. A. Hawkins, Washington, D. C.—p. 616.

Effect of Thyroidectomy and Thyroxine on Response of Denervated Heart to Injected and Secreted Adrenine. M. E. M. Sawyer and M. G. Brown, Boston.—p. 620.

Analysis of Function of a Nerve to Muscle. J. O'Leary, P. Heinbecker and G. H. Bishop, St. Louis.—p. 636.

Blood and Plasma Viscosity Determined by Method of Concentric Cylinders. J. T. Brundage, with assistance of I. Grobman, Philadelphia.—p. 659.

Time of Occurrence of Cortical Response as Determined by Area of Stimulus Object. S. H. Bartley, St. Louis.—p. 666.

Nature of Ventricular Fibrillation Following Electric Shock and Its Prevention by Acetyl-β-Methyl Choline Chloride. H. E. Hoff and L. H. Nahum, New Haven, Conn.—p. 675.

Some Influences of Estrin on Hypophyseal-Gonad Complex of Immature Female Rat. C. E. Lane, Madison, Wis.—p. 681.

Inhibition of Gastric Secretion by Oil of Peppermint. H. Necheles and J. Meyer, Chicago.—p. 686.

Separation of Thyrotropic from Gonadotropic Substances of Pituitary. R. O. Greep, Madison, Wis.—p. 692.

Nervous Control of Intercostal Respiration. D. W. Bronk and L. K. Ferguson, Philadelphia.—p. 700.

Response to Steady Pressures of Single End Organs in Isolated Carotid Sinus. D. W. Bronk and G. Stella, Philadelphia.—p. 708.

American Journal of Public Health, New York

25: 1-108 (Jan.) 1935

Concern of the United States with Tropical Diseases. F. W. O'Connor, New York.—p. 1.

Civil Works Administration; Emergency Relief Administration; Malaria Control Program in the South. L. L. Williams Jr., Washington, D. C.—p. 11.

Report of Special School Health Studies in New York City. D. B. Armstrong, New York.—p. 15.

Housing Problem in a Southern City, with Especial Reference to Its Influence on Residual Typhoid Fever and on Infant Mortality. L. M. Graves and A. H. Fletcher, Memphis, Tenn.—p. 21.

The Public Health Officer and the Control of Syphilis. J. E. Moore, Baltimore.—p. 31.

Natural Immunization to Diphtheria in an Institution. C. C. Young, Lansing, Mich.; G. D. Cummings and M. E. Wilson, Lapeer, Mich. —p. 43.

Sources and Modes of Infection in Two Family Outbreaks of Syphilis. A. L. Gray, Jackson, Miss., and W. H. Cleveland, Tupelo, Miss.— p. 49.

Active Immunization Against Poliomyelitis. M. Brodie, New York. —p. 54.

Reduction of Maternal and Infant Mortality in Rural Areas. J. H. M. Knox Jr., Baltimore.—p. 68.

The Ninth Pan-American Sanitary Conference. K. Emerson, New York.—p. 76.

American Journal of Tropical Medicine, Baltimore

15: 1-90 (Jan.) 1935

Educational Background for Practice of Tropical Medicine. F. F. Russell, New York.—p. 1.

Small Spleen in Malaria Surveys. P. F. Russell, New York.—p. 11.

First Fatal Case of Chagas' Disease Observed on Isthmus of Panama. E. DeCoursey, Ancon, Canal Zone.—p. 33.

Absence of Tissue Invasion in Monkey Carriers of Endamoeba Histolytica. R. Hegner, Baltimore.—p. 41.

*Human Intestinal Myiasis Due to Larvae of Soldier Fly, Hermetia Illucens Linné (Diptera, Stratiomyidae). H. E. Meleney and P. D. Harwood, Nashville, Tenn.—p. 45.

Use of Guinea-Pigs in Tests of Immunity Against Yellow Fever with Small Quantities of Serum. W. Lloyd and A. F. Mahaffy, Lagos, Nigeria, West Africa.—p. 51.

Tropical Medicine in New York City. T. T. Mackie, Ithaca, N. Y. —p. 59.

Malaria Studies in Greece: Reaction of Anopheline Mosquitoes to Certain Microclimatic Factors. R. C. Shannon, New York.—p. 67.

Human Intestinal Myiasis Due to Larvae of Soldier Fly.—Meleney and Harwood report a case of intestinal myiasis in a boy due to the larvae of the soldier-fly, Hermetia illucens Linné. This is apparently the second human case to be recorded. Descriptions of the larva and adult fly are given. The larvae caused symptoms of local irritation in the stomach and rectum, and spells of fainting. They were apparently acquired by eating raw fruit or vegetables on which the eggs of the fly had been deposited.

Anatomical Record, Philadelphia

61: 141-260 (Jan. 25) 1935

Follicular Apparatus of Ovary of Immature Rat and Some of the Factors Which Influence It. C. E. Lane, Madison, Wis.—p. 141.

*Fate of Ultimobranchial Body Within Human Thyroid Gland. B. F. Kingsbury, Ithaca, N. Y.—p. 155.

Prepubertal Reversal of Sex Difference in Gonadotropic Hormone Content of Pituitary Gland of Rat. Helen M. Clark, New York.—p. 175.

Sex Difference in Change in Potency of Anterior Hypophysis Following Bilateral Castration in New-Born Rats. Helen M. Clark, New York. —p. 193.

Studies on Development of Human Lung: I. Pulmonary Lymphatics. D. F. Harvey and H. M. Zimmerman, New Haven, Conn.—p. 203.

Quantitative Study and Interpretation of Occurrence of Basophil (Mast) Cells in Subcutaneous Tissue of Albino Rat. E. O. Bates, Ithaca, N. Y.—p. 231.

Probable Superfetation in Cat: Case. J. E. Markee and J. C. Hinsey, San Francisco.—p. 241.

Studies on Uterine Growth: I. Does Thoracolumbar Sympathectomy Affect Growth of Pregnant Cat Uterus? J. C. Hinsey and J. E. Markee, San Francisco.—p. 253.

Ultimobranchial Body in Human Thyroid.—The examination of forty selected human embryos, from 13 to 55 mm. in length, has furnished Kingsbury with no conclusive evidence of the development of thyroid parenchyma from material contributed by the caudal pharyngeal complex. On the contrary, the evidence has indicated that after fusion with the median

thyroid the complex undergoes reticulation and progressive degeneration. Thus there seems to be no justification for substituting the term lateral thyroid for that more usually employed—ultimobranchial body.

Colorado Medicine, Denver

32: 1-88 (Jan.) 1935

Acute Abdominal Conditions in Children. J. Brenneman, Chicago. —p. 14.
Dangers of Proprietary Drugs. E. Jackson, Denver.—p. 23.
Discussion of Problem of Contraception. C. B. Ingraham, Denver. —p. 26.
Some Phases of Medical Economics. P. S. Read, Worland, Wyo.—p. 42.

Journal of Pharmacology & Exper. Therap., Baltimore

53: 1-138 (Jan.) 1935

Cerebral Circulation: XXXIV. Action of Narcotic Drugs on Pial Vessels. J. E. Finesinger and S. Cobb, Boston.—p. 1.
Respiratory Effects of Morphine, Codeine and Related Substances: III. Effect of Morphine, Dihydromorphine, Dihydromorphinone (Dilaudid) and Dihydrocodeinone (Dicodid) on Respiratory Activity of Rabbit. C. I. Wright and F. A. Barbour, Ann Arbor, Mich.—p. 34.
Iodine Remission in Experimental "Exophthalmic Goiter" of Guinea-Pigs. H. B. Friedgood, Baltimore.—p. 46.
Metabolic Activity of Compounds Related to Dinitrophenol. M. L. Tainter, F. W. Bergstrom and W. C. Cutting, San Francisco.—p. 58.
Chemistry and Toxicity of Mussel Poison. H. Müller, San Francisco. —p. 67.
Comparative Study of Cyclopropane and Ethylene with Reference to Body Saturation and Desaturation. M. H. Seevers, S. F. De Fazio and S. M. Evans, Madison, Wis.—p. 90.
Elimination of Uric Acid from Rat's Liver by Action of Phenylcinchoninic Acid (Cinchophen) and Ethyl Ester of Paramethylphenylcinchoninic Acid (Tolysin). O. Fürth and E. Edel, Vienna, Austria. —p. 105.
Effect of Ergotamine Tartrate on Cerebral Circulation of Man. W. G. Lennox, E. L. Gibbs and F. A. Gibbs, Boston.—p. 113.
Comparative Study of Actions of Morphine and Dilaudid (Dihydromorphinone Hydrochloride) on Intact Small Intestine of Dog. C. M. Gruber and J. T. Brundage, with assistance of A. DeNote and R. Heiligman, Philadelphia.—p. 120.
Studies on Barbiturates: Distribution of Barbiturates in the Brain: Remarks on Publication of Same Title by Koppanyi, Dille and Krop. E. Keeser and I. Keeser, Hamburg, Germany.—p. 137.

Kansas Medical Society Journal, Topeka

36: 1-44 (Jan.) 1935

Hyperparathyroidism. F. W. Rankin, Lexington, Ky.—p. 1.
Puerperal Infection. T. K. Brown, St. Louis.—p. 5.
Benign Prostatic Obstruction: Gross Pathology and Its Relation to Type of Treatment. A. G. Isaac, Newton.—p. 9.
*Chronic Endogenous Hypoglycemia with Neuropsychiatric Syndrome. L. Stone, Topeka.—p. 13.
Traumatic Ruptured Spleen—Splenectomy—Cure. L. W. Angle and H. W. Kassel, Kansas City.—p. 22.

Chronic Endogenous Hypoglycemia.—Stone cites a case of chronic endogenous hypoglycemia with a neuropsychiatric syndrome. The hypoglycemia is thought to be probably of hepatic origin. The case represents a disease entity, only recently appreciated by medical men, which is probably far more common than the frequency of diagnosis would indicate. The diagnosis will probably be made with increasing frequency as the concept becomes more widely accepted. It should be borne in mind that certain clinical features of the disease and blood sugar determinations are both essential to proper diagnosis. Although the study of the urine may give invaluable information about hyperglycemia or renal function, the urine in hypoglycemia is usually lacking in distinguishing characteristics. A clue may be found in the small proportion of cases with sugar-free acetonuria, in the absence of other causes. This, however, is not pathognomonic and direct blood chemistry is always indispensable to a complete diagnosis.

Minnesota Medicine, St. Paul

18: 1-64 (Jan.) 1935

Treatment of Pelvic Inflammation by Heat: Indications and Results. L. M. Randall and V. S. Counseller, Rochester.—p. 1.
Hemorrhage in Obstetrics. R. T. La Vake, Minneapolis.—p. 4.
Roentgenologic Diagnosis of Placenta Praevia. W. H. Ude and J. A. Urner, Minneapolis.—p. 9.
Menopausal and Postmenopausal Bleeding. H. M. N. Wynne, Minneapolis.—p. 12.
Essential Thrombocytopenic Purpura. C. O. Kohlbry, Duluth.—p. 15.
Electrocardiography as Diagnostic Adjunct in Anginal Syndrome of Coronary Sclerosis. F. A. Willius, Rochester, Minn.—p. 20.
Borderline Between Neuropsychiatry and General Medicine. F. J. Hirschboeck, Duluth.—p. 26.
Blood Transfusion in Treatment of Sepsis. D. K. Bacon, St. Paul. —p. 30.

New England Journal of Medicine, Boston

212: 43-86 (Jan. 10) 1935

Fractures of Femoral Neck Treated by Blind Nailing. J. W. O'Meara, Worcester, Mass.—p. 43.
Present Status of Infection of Upper Respiratory Tract in Its Relation to Focal Infection. W. V. Mullin, Cleveland.—p. 50.
Diagnosis of Chronic Infection of Tonsils in Relation to Indications for Operation in Cases of Chronic Focal Infection. G. M. Coates, Philadelphia.—p. 52.
James Jackson (1815) and Digitalis: Historical Note. H. A. Christian, Boston.—p. 54.
Diagnosis in Spinal Fluid Contaminated by Blood: The Bloody Tap. P. Solomon, Boston.—p. 55.
Injection Treatment of Internal Hemorrhoids. F. G. Balch Jr., Boston. —p. 57.
Malnutrition: The Medical Octopus. J. P. Sutherland, Boston.—p. 60.

Northwest Medicine, Seattle

34: 1-36 (Jan.) 1935

Recent Trends in Medicine. W. S. Middleton, Madison, Wis.—p. 1.
Glaucoma: Some Practical Considerations. A. J. Browning, Portland, Ore.—p. 6.
Sensitization in Eczema: Some Phases of Its Problem. H. Odland, Seattle.—p. 9.
Cosmetic Dermatitis. R. M. Balyeat, Oklahoma City.—p. 12.
Gonorrhea in the Male. J. G. Strohm, Portland, Ore.—p. 13.
Periappendicitis Due to Penetration by Oxyuris Vermicularis. C. G. Bain, Centralia, Wash.—p. 14.
Future of Medical Practice. W. T. Johnson, Corvallis, Ore.—p. 15.
Economic Problems of Physicians of Washington. H. J. Davidson, Seattle.—p. 18.
Care of County Indigents. E. L. Spohn, d'Alene, Idaho.—p. 21.

Pennsylvania Medical Journal, Harrisburg

38: 233-308 (Jan.) 1935

Diagnosis and Treatment of Cancer of Large Bowel. J. S. Horsley, Richmond, Va.—p. 233.
Diagnosis and Treatment of Nontuberculous Pulmonary Disease. B. Gordon, Philadelphia.—p. 238.
Treatment of Antral Disease. W. L. Allison, Pittsburgh.—p. 241.
*Venous Pressure: Its Clinical Importance with Simplified Technic for Its Determination by Direct Method. W. G. Leaman Jr., Philadelphia. —p. 244.
Treatment of Enuresis: Past and Present. M. R. Goldman, Pittsburgh. —p. 247.
Influenzal Frontal Sinusitis Complicated with Meningo-Encephalitis: Complete or Partial Paralysis of All Cranial Nerves Except Cochlear Branch of Auditory, with Complete Recovery. P. S. Stout, Philadelphia.—p. 251.
Management of Cutaneous Ringworm Infections. J. P. Guequierre, Philadelphia.—p. 255.
Report of State Society Committee on Appendicitis Mortality. J. O. Bower, Philadelphia.—p. 257.
Medical Care of Aged. R. R. Snowden, Pittsburgh.—p. 260.

Venous Pressure.—For two years, Leaman has used the direct method of determining venous pressure. The apparatus consists of an 18 gage needle, a special adapter, a 20 cc. syringe and an upright manometer tube with a 4 mm. bore graduated in centimeters. Before the determination is made, the patient should rest on an examining table without a pillow for fifteen minutes, during which time the apparatus may be sterilized in 70 per cent alcohol. The patient's arm is prepared and then supported until parallel to an imaginary line in the midaxilla. A cuff of a blood pressure apparatus is placed round the upper arm and inflated to 20 mm. of mercury. The apparatus is assembled with the needle on one end of the adapter and the syringe on the other. The stopcock of the adapter must be kept parallel to the needle. As the needle enters the vein, the amount of blood needed for the laboratory is drawn into the syringe and the air is allowed to escape from the cuff of the blood pressure apparatus. The manometer tube is now fitted into the adapter perpendicular to the arm and the stopcock moved up until it is parallel to the manometer tube. Blood will at once start up the tube, and when the column has ceased rising the level on the tube is read. This is the venous pressure, which may be recorded as centimeters of water. To prove the absence of clotting and check the reading, the cuff may be inflated slightly. The column will mount promptly in the tube. When subsequent readings are taken the needle may be introduced on the syringe and adapter or on the adapter alone with the stopcock parallel to the manometer tube. The amount of blood lost at subsequent readings amounts to only a few cubic centimeters. The venous pressure of normal patients at rest in recumbency ranges between 4 and 12 cm. of water.

Exercise causes an increased flow of blood to the heart, but in the presence of an intact myocardium the demand is almost immediately met. If the heart is incompetent there is a high venous pressure reading after exertion which, if sustained, is indicative of impending cardiac failure. Venous pressure readings will be found to be subject to diurnal variations. They are lower during sleep. The opposite is true in cases of congestive failure. Age does not influence the venous pressure if the previously stated precautions in obtaining the reading are followed. Respiratory variations in the level of the top of the column will be noticed as soon as the first venous pressure readings are made. During inspiration the negative intrathoracic pressure is greater and causes more complete emptying of the larger veins, with a consequent drop in the peripheral venous pressure. The opposite is true during expiration. Single venous pressure determinations, like single blood pressure readings, will prove of little value. It is the venous pressure trend that is significant.

Radiology, Syracuse, N. Y.

24: 1-130 (Jan.) 1935

Increased Irritability of Gastro-Intestinal Tract: Discussion of Disturbed Physiology. B. A. Rhinehart, Little Rock, Ark.—p. 1.
Protracted External Irradiation in Treatment of Neoplasms of Mouth and Throat: Comparison of X-Rays, 5-Gram Radium Pack and 100-Milligram Radium Pack. M. Friedman and Rieva Rosh, New York.—p. 7.
Roentgen Therapy in Syringomyelia. F. W. O'Brien, Boston.—p. 16.
*Osteitis Tuberculosa Multiplex Cystica: Report of Two Cases. J. H. Vastine and Emily P. Bacon, Philadelphia.—p. 22.
Volume Increase of Bacteria from X-Ray Irradiation. T. J. Dietz, Schenectady, N. Y.—p. 31.
Simplified Mechanical Method for Radiographic Mensuration and Localization. H. E. Kimble, Chicago.—p. 39.
Diverticula of Fundus of Stomach. L. W. Paul, Madison, Wis.—p. 47.
Basophilic Adenoma (Pituitary Basophilism): Report of Case, with Clinical Improvement of Systemic Manifestations After Irradiation of Pituitary. M. G. Wohl, J. R. Moore and B. R. Young, Philadelphia.—p. 53.
Management of Productive Lesion in Pulmonary Tuberculosis: Study of Five Hundred Cases. C. C. Birkelo and S. M. Gelenger, Detroit.—p. 58.
Progress, Indications, Technic and Successful Results of Radiotherapy in Prostatic Hypertrophy. I. González-Martínez, San Juan, Puerto Rico.—p. 66.
*X-Ray Experimental Studies Showing That Rachitic Rats with Healed Bone Lesions Continue to Show Alteration in Their Gastro-Intestinal Tract. L. J. Menville, J. N. Ané and S. N. Blackberg, New Orleans.—p. 74.
Roentgen Pelvimetry and Fetal Cephalometry: New Technic: Preliminary Report. R. P. Ball and S. S. Marchbanks, Chattanooga, Tenn.—p. 77.
Encephalographic Experiences: Medicolegal Deductions. E. S. Gurdjian and H. A. Jarre, Detroit.—p. 85.
Cancer Metastatic to Bone. W. A. Fort, Mare Island, Calif.—p. 96.
Treatment of Epithelioma of Cheek. G. E. Pfahler, Philadelphia.—p. 99.

Cystic Tuberculosis of the Bone.—Vastine and Bacon report two cases of cystic tuberculosis of the bone. The diagnosis in one was made by biopsy and in the other case clinically and roentgenologically but was not confirmed. The roentgen observations were quite diagnostic. The authors state that cystic tuberculosis of bones in children is due to dissemination of the tubercle bacilli through the blood stream, probably from a caseous lymph node in the chest. There may or may not be swelling over the involved bones. Since these cystic areas are apparently painless, the condition is doubtless more common than the literature would indicate. Routine fluoroscopy of the long bones in infants, examined roentgenologically with a question of tuberculosis in the chest, may lead to more frequent recognition of the condition. The cystic areas sometimes break through the cortex and form abscesses, which rupture through the overlying skin so that sinuses develop. Fever is not necessarily present. It may occur as a result of secondary infection through a draining sinus or as a result of the primary tuberculous process in the chest. There is an associated secondary anemia. Leukopenia and slight lymphocytosis may be found. The blood chemistry is not changed, this being an important diagnostic aid in differentiating cystic tuberculosis from osteitis fibrosa cystica. Diagnosis should be made from roentgenograms, in which the appearance is quite characteristic. The blood calcium and phosphorus are within the normal limits in cystic tuberculosis. A strongly positive tuberculin reaction is important diagnostic evidence. Clinical or roentgen evidence of an infantile tuberculous process in the chest, particularly involvement of the bronchial glands, was found in the authors' cases.

Healing of Rachitic Bone Changes in Rats.—The experiments of Menville and his co-workers definitely demonstrate that young rats, made rachitic, show a marked hypomotility of their gastro-intestinal tracts and that the healing of their rachitic bone changes by the different means employed does not relieve them of their hypomotility even after a period of months when the bones have healed. If the life cycle of these rats is compared with that of human beings it must be concluded that, if the cause of constipation in rachitic rats is due to muscular weakness and relaxation of their gastro-intestinal tracts, as evidenced by hypomotility, rachitic patients who have had their bone lesions healed by the various methods employed at the present time are apt to continue to show alterations in the motility of their gastro-intestinal tracts for a long time after they are considered cured of rickets.

Rhode Island Medical Journal, Providence

18: 1-16 (Jan.) 1935

If I Were a Medical Man. W. H. Rivard, Providence.—p. 1.
Some Nervous and Mental Problems of Childhood: Illustrative Case Report. C. Bradley, East Providence.—p. 2.
Contraction of Color Fields in Neurosyphilis. W. M. Muncy, Providence.—p. 9.
Giardiasis: Clinical Study. R. S. Bray and W. Leet, Providence.—p. 10.

South Carolina Medical Assn. Journal, Greenville

31: 1-20 (Jan.) 1935

Macrocytic Anemia. R. Wilson Jr., Charleston.—p. 5.
Cancer of Cervix. O. D. Baxter, Sumter.—p. 10.
Precancerous Lesions and Early Cancer. W. M. Sheridan, Spartanburg.—p. 13.

Southwestern Medicine, Phoenix, Ariz.

19: 1-32 (Jan.) 1935

Classification and Treatment of Nephritis. F. H. Heller, Pueblo, Colo.—p. 1.
Health Survey in New Mexico: Incidents of Survey. H. S. A. Alexander, Santa Fe, N. M.—p. 4.
Local Health Activities in Texas. J. W. Brown, Austin, Texas.—p. 8.
Present Status of X-Ray and Radium Therapy in Tonsils. J. S. Summers, Jefferson City, Mo.—p. 11.
Some Problems of Obstetrics. G. Heusinkveld, Denver.—p. 14.
Prevention of Heart Disease. M. K. Wylder, Albuquerque, N. M.—p. 18.
Management of Intractable Asthma. R. A. Wilson, Tucson, Ariz.—p. 22.

Surgery, Gynecology and Obstetrics, Chicago

60: 129-256 (Feb. 1) 1935

Atypical Growth Induced in Cervical Epithelium of Monkey by Prolonged Injections of Ovarian Hormone Combined with Chronic Trauma. M. D. Overholser and E. Allen, Columbia, Mo.—p. 129.
*Origin of Pilonidal Sinus with Analysis of Its Comparative Anatomy and Histogenesis. S. L. Fox, Baltimore.—p. 137.
Function of Long Plantar Muscles. T. A. Willis, Cleveland.—p. 150.
*Blood Sedimentation Test and Its Value in Differential Diagnosis of Acute Appendicitis. A. Lesser and H. A. Goldberger, New York.—p. 157.
Malignant Diseases in First Three Decades of Life. B. F. Schreiner and W. H. Wehr, Buffalo.—p. 167.
Study of Action of Ergot on Human Puerperal Uterus. A. K. Koff, Chicago.—p. 190.
Present Status of Sterility of Surgical Catgut Sutures, with Particular Reference to American Made Catgut. R. O. Clock, New York.—p. 202.
*Reaction of Lipids in Blood Leukocytes to Fever and Infection. E. M. Boyd, Rochester, N. Y.—p. 205.
Operation for Repair of Internal and External Lateral Ligaments of Knee Joint. W. C. Campbell, Memphis, Tenn.—p. 214.
Surgical Treatment of Tuberculous Empyema. R. H. Macdonald, Saskatoon, Sask.—p. 216.
Uterosalpingography by Interrupted Fractional Injections: Modified and Improved Technic. M. N. Hyams, New York.—p. 224.
Tuberculous Abscesses of the Brain Secondary to Tuberculosis of Cecum. C. W. Rand, Los Angeles.—p. 229.
Paraldehyde as Factor in Painless Labor. H. H. Rosenfield and R. B. Davidoff, Boston.—p. 235.

Origin of Pilonidal Sinus.—Fox presents evidence from studies on the human embryo which indicate that: 1. The pilonidal sinus is a derivative of skin ectoderm and not neurogenic or enteric in origin. 2. The structures forming the sinus are derived by a process of ectodermal invagination from the

surface of the skin at the time and in the cells destined to form skin appendages (hair and glands) during the third and fourth months of embryonic life. 3. Its mode of origin and the analogy drawn between this structure and the special "scent" gland in the sacrococcygeal region of birds and amniotes suggest the probability that the sinus represents a vestigial skin appendage developing at puberty—hence the age distribution of pilonidal sinuses. 4. Coccygeal medullary vestiges do not give rise to the pilonidal sinus. They probably give rise to the large cystic and solid tumors that occur usually in infants and the new-born. There is also the possibility that they may play a part in the upward direction which the pilonidal sinus takes. 5. Clinical and pathologic observations are presented and explained by this theory. 6. The coccygeal region may possess several sites for the origin of paraganglioma instead of only Luschka's gland, as originally thought. 7. Recurrence following operation for pilonidal sinuses should take place in less than 10 per cent of the cases and is due to the fact that certain of the ramifications are left behind. Since the coccyx is fully developed in the first six weeks of fetal life and has no dorsal arches, and since the fourth and fifth sacral vertebrae have only vestiges of the neural arch, it is illogical to assume that the coccygeal medullary vestiges may be included within the sacrococcygeal joint. In operations for pilonidal sinus wherein the coccyx is removed and the sacral stump curetted, the improvement is due to the removal of the contiguous infection of periosteal or bony parts. 8. In the prevention of recurrences, wherever the sinus tract extends to the bony parts, the periosteal and fibrous layers should be carefully stripped off and curetted. Dead spaces and recesses with inflammatory products should be guarded against by preventing too early epithelial bridging of the wound and by careful packing.

Blood Sedimentation Test in Appendicitis.—Lesser and Goldberger submit a modification of the Westergren technic allowing accurate Westergren interpretation. Test tubes are prepared, each containing 30 mg. of dried sodium citrate; these tubes are kept available in the wards at all times. To perform the test, 4.5 cc. of blood is drawn from a vein, added to a test tube and shaken thoroughly; the test then proceeds as in the original method. However, readings were taken at the end of fifteen minutes and at the end of the hour, the final hour reading giving the desired information as to rapidity and intensity of the reaction. The authors' study is based on the observations of 3,000 readings in 2,000 cases. The sedimentation reading in cases of acute appendicitis (catarrhal, suppurative or gangrenous) is uniformly normal. The sedimentation readings in all other acute abdominal conditions are consistently abnormal. Further, the sedimentation readings in all extra-abdominal conditions simulating acute conditions of the abdomen are consistently abnormal. No physicochemical or anatomic explanation for this phenomenon is offered but presents itself as a problem for further study. A significant observation is described and offered as a potential specific aid in the differential diagnosis of acute appendicitis.

Reaction of Lipids in Blood Leukocytes to Infection.—Boyd's investigations demonstrate that the white blood cells undergo marked metabolic variations, as indicated by changes in their lipid content, in pregnancy, lactation, postoperative convalescence, fever and convalescence from fever. He presents twenty-six complete differential analyses of the lipids in the leukocytes under fasting conditions in twelve cases of fever. In each analysis the lipids determined were: free cholesterol, ester cholesterol, total cholesterol, phospholipid, neutral fat, total fatty acids and total lipid. Oxidative micromethods were used. In patients who recovered normally from fever due to a variety of causes, the white blood cells contained large amounts of phospholipid. There was generally also an increased value for free cholesterol with low figures for ester cholesterol and neutral fat. In these, convalescence was accompanied by a further rise in phospholipid. Patients who died as a result of their infection were noted to have low phospholipid values in the blood leukocytes during the febrile period. The same was found true in a case of thrombophlebitis when complications developed. The activity of the white blood cells may be measured by determining their lipid content, especially the phospholipid fraction. Data from one case suggests that a blood transfusion may increase the activity of the white blood cells.

Tennessee State Medical Assn. Journal, Nashville

28: 1-46 (Jan.) 1935

Purulent Pleuritis in Children. O. W. Hill, Knoxville.—p. 1.
Black Widow Spider Bite: Report of Four Cases. J. B. Wright, Lynnville.—p. 6.
*Pathologic Basis for the Disabled Back. G. K. Carpenter, Nashville.—p. 8.
A Day in Court. J. K. Hall, Richmond, Va.—p. 14.
Urinary Urobilinogen: Value of Routine Estimation. P. H. Levinson, Chattanooga.—p. 17.
Optic Atrophy Due to Chiasmal Tumor. R. O. Rychener, Memphis.—p. 20.
Management of Puerperal Eclampsia in the Home. K. S. Howlett, Franklin.—p. 22.
Abdominal Pain Often a Symptom Referable to Kidney. G. R. Livermore, Memphis.—p. 27.
*Undistorted Radiography in Obstetrics. E. F. Buchner, Chattanooga.—p. 30.
Group of Diseases Dependent on Paranasal Sinusitis as the Cause. N. E. Hartsook, Johnson City.—p. 32.

Pathologic Basis for the Disabled Back.—Carpenter states that injury to the intervertebral disk, whether the result of disease or of trauma, either acute or chronic, must be given consideration as the pathologic process responsible for any back disability. The intervertebral disk injury is not revealed by roentgen examination, but the resulting vertebral changes produce characteristic roentgen appearances. Intervertebral disk injury manifests itself most frequently as (1) retropulsion of the nucleus pulposus into the spinal canal, (2) prolapse of the nucleus pulposus into the adjacent vertebral body, (3) localized vertebral osteo-arthritis, (4) generalized vertebral osteo-arthritis, (5) thinning of the intervertebral disks, with or without wedging of the vertebral bodies, and (6) biconcave vertebral bodies and spherical disks. Since the knowledge of the intervertebral disk has recently been greatly advanced, one is often able to find a disturbance of the intervertebral disk as the pathologic basis for the disabled back.

Undistorted Radiography in Obstetrics.—To avoid distortion of the image within the limits of practicability in obstetrics, Buchner suggests that teleroentgenograms be taken, particularly lateral teleroentgenograms. These will record antepartum signs directly and without bias. He recommends the use of the six-foot tube distance, 10 milliamperes at from 90 to 110 kilovolts peak for forty seconds with the Potter-Bucky diaphragm. The patient should lie on her back at a right angle to the path of the ray with the caset held vertically to assure a true lateral picture. There will be no magnification of the image necessitating correction, and the most important measurements may be taken directly from the one roentgenogram. The fetal biparietal diameter is the cephalic diameter desired, and the one usually found, and the anterior or posterior tendency of the fetal spine is readily seen in both vertex and breech presentations. The thickness of the maternal soft parts separating the fetal and maternal bony structures can frequently be clearly traced. The true conjugate can be measured from the sacral promontory to the anterior-inferior border of the superimposed acetabular rings, as this represents the inner or obstetric surface of the symphysis pubis in the roentgenogram. In this manner, no special apparatus or difficult patient position is necessary, only one 14 by 17-inch film is used, and from that the most important diameters are read directly with an ordinary centimeter ruler.

United States Naval Med. Bulletin, Washington, D. C.

33: 1-168 (Jan.) 1935

Motor Vehicle Damage to Men of the Navy. L. W. Johnson.—p. 1.
Report of Injuries Admitted to Hospital Ship in One Year. A. H. Dearing.—p. 14.
Practice of Medicine in American Samoa. J. L. Schwartz.—p. 27.
Gastric Retention in Peptic Ulcer. C. C. Kress.—p. 35.
Physiology, Pathology and Diagnosis of Nephritis. E. P. Kunkel.—p. 44.
Method of Local Anesthesia for Intranasal Operations. F. F. Lane.—p. 55.
Russell Treatment of Fractures of the Femur. H. A. Gross.—p. 59.
Four Interesting Surgical Cases. K. E. Lowman.—p. 64.
Goiter. O. D. King.—p. 68.
Fractures of the Maxillae. E. B. Howell.—p. 76.
Appendicitis. R. D. Joldersma.—p. 78.
Industrial Medicine. H. L. Shinn.—p. 84.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Archives of Disease in Childhood, London

9: 335-378 (Dec.) 1934

*Urea Clearance Test in Children. W. W. Payne and H. Shukry.—p. 335.
Cutaneous Myiasis in Infants. N. Silverthorne and A. Brown.—p. 339.
Hematology of Infantile Sepsis. Pauline Klenerman.—p. 343.
*Pollen Sensitiveness in Children with Asthma. R. B. Pearson.—p. 353.
Iron Deficiency Anemia in Children: Its Association with Gastro-Intestinal Disease, Achlorhydria and Hemorrhage. J. C. Hawksley, R. Lightwood and Ursula M. Bailey.—p. 359.
*Relapse in Scarlet Fever. J. S. Anderson.—p. 373.

Urea Clearance Test in Children.—Payne and Shukry examined thirty-nine children suffering or convalescent from diseases not involving the renal tract. The urine was tested and was normal in all but one child, who was passing albumin and had hemophilia with no history of renal involvement. The average for children is higher than that for the adult and the zone into which most cases fall is also greater (80-140 as against 80-120). In examining the results applied to individual cases, the authors found that no normal case failed to exceed in at least one test the minimal value. McLean's test was applied to the same group, and in all but one values of more than 2.5 per cent of urea were obtained in one or more specimens indicating a normal function. In the one failure the highest value was 2.4 per cent and this was in the same case of hemophilia. Another group of thirteen children having some disease involving the kidney were examined by each test. There was no great difference between the two clearance tests, but in three cases doubtful results according to the standard test were definitely abnormal in the maximal test. McLean's concentration test gave normal results in six cases in which the maximal test gave an abnormal response. Therefore it is apparent that the capacity of the kidney to excrete urea decreases earlier in disease than the capacity to concentrate urea in the urine. The urea clearance test is more likely to detect early loss of kidney function than is McLean's concentration test.

Pollen Sensitiveness in Children with Asthma.—To estimate the frequency with which pollen sensitization occurred in asthmatic children, Pearson examined 250 unselected children attending the asthma clinic. The children examined were divided into four groups: (1) those whose asthma occurred at all seasons of the year, (2) those who were worse in the summer, (3) those who were worse in the winter, and (4) those whose symptoms had not been present for a sufficient length of time to allow classification. Grass pollen is of greater importance in the precipitation of asthmatic attacks than is generally recognized. Of the children tested, 42 per cent gave skin reactions to pollen. A series of thirty-three children of the same age group, not suffering from any allergic condition, attending the general medical outpatient clinic, were tested with the same extract, and none of them gave any reaction. If the asthmatic groups are subdivided according to age, an increase in the number of cases giving positive reactions occurs after the age of 9 years. This is in accordance with the well recognized fact that sensitiveness to inhalants becomes more marked as childhood advances. When sensitiveness to pollen was considered in relation to the mode of onset, it was found that the groups who have or have had allergic eczema (20 per cent of the series) show the highest proportion of reactors (66 per cent). The capacity for sensitization to allergens of all types seems to be far higher in this than in any other group. For example, 42 per cent stated that they were clinically sensitive to certain foods compared with 12 per cent of the remainder: 22 per cent were clinically sensitive to egg compared with 4 per cent of the rest. The group of apparently pure spasmodic asthma gives the next figure of 42 per cent, while those patients in whom asthma followed a respiratory infection (such as bronchitis, whooping cough or pneumonia) give 34 per cent positive responses.

Relapse in Scarlet Fever.—Anderson shows that the development of immunity after an attack of scarlet fever is not invariable by the occurrence of second attacks and relapses. Second attacks, developing some months or years after the first attack, are according to Rolleston more uncommon than relapses, yet it is noteworthy that, of the admissions in 1933 to the Leeds City Hospital, 3.5 per cent gave a history of a previous attack. As regards relapses the same authority, after making allowance for errors in the original diagnosis, estimates that a return of all the characteristic symptoms of the disease occurs in about 1 per cent of all cases. The relapse rates for the Leeds City Hospital for the years 1931, 1932 and 1933 were 3.6, 4 and 4.3 per cent, respectively. Such rates appear to be high and they give rise to an administrative problem, as they indicate an additional burden on the available accommodation of the hospital and a definite increase in the cost of treatment of scarlet fever. The author suggests the administration of scarlatinal toxin as a logical procedure in the prevention of relapses.

British Journal of Dermatology and Syphilis, London

47: 1-50 (Jan.) 1935

Nature and Causation of Skin Pigmentation in Hemochromatosis. F. F. Hellier.—p. 1.
Dermatitis Due to Podophyllum Resin. W. J. O'Donovan.—p. 13.
Multiple Benign Superficial Epithelioma. E. B. Tauber and L. Goldman.—p. 21.

British Journal of Ophthalmology, London

19: 1-64 (Jan.) 1935

Catarrhal Diphtheritic Conjunctivitis. J. Francois.—p. 1.
*Disturbances of Visual Apparatus in Toxemias of Pregnancy Associated with Eclampsia or Preeclamptic State. R. E. Wright, K. K. Nayar and T. V. Nayudu.—p. 19.
Structure of Herbert's Pits. A. Busacca.—p. 26.
Retinal Detachment Presenting Certain Unusual Features After Operation by Surface Diathermy: Two Cases. H. B. Stallard.—p. 31.
Result of Orthoptic Treatment in Divergent Strabismus. Sheila Mayou.—p. 37.
Fixation of Specimens for Celloidin Sectioning: Note. W. A. Gray.—p. 47.
Double Congestive Glaucoma and Response to Diathermy. J. E. Martin.—p. 48.

Visual Disturbances in Toxemias of Pregnancy.—Wright and his co-workers assert that practical blindness associated with normal eyegrounds may follow the eclamptic state, the presumption being that the injury has acted at a higher level than the third neuron. The loss of vision may also result from an injury acting at the retinal level either suddenly (usually recovered in whole or in part) or gradually and permanently (owing to late changes in the vessels). Minor injuries may take place involving the retinal vessels, as evidenced by hemorrhages, edema and alteration in the caliber of arteries and veins without immediate interference with vision; such are relatively common. The lesser spastic phenomena of the arteriolar tree described of recent years were probably missed in the authors' cases, owing to the hurried nature of the ophthalmoscopic observation, rather than absent, on account of any peculiarity in the local conditions. Detachment of the retina as a sequel to the toxemias of pregnancy has not been observed by the authors in the last ten years.

British Medical Journal, London

2: 1137-1186 (Dec. 22) 1934

*Weil's Disease (Leptospirosis): Clinical and Bacteriologic Study of Nineteen Cases Occurring Chiefly Among Fish Workers. L. S. P. Davidson, R. M. Campbell, H. J. Rae and J. Smith.—p. 1137.
Account of Weil's Disease in Queensland. J. G. Drew.—p. 1142.
Modern Sanatorium Treatment. A. S. MacNalty.—p. 1143.
Septicemia Following Tonsillectomy: Record of Cases. B. Morgan.—p. 1145.
Acute Iodism Following Lipiodol Bronchography. J. G. Scadding.—p. 1147.

Weil's Disease.—Davidson and his associates discuss nineteen cases of Weil's disease, in fifteen of which the clinical diagnosis was confirmed by bacteriologic or serologic tests. Thirteen of the patients were employed in the handling and cleaning of fish. These observations show that workers among fish must be included in the occupational groups especially liable to Weil's disease. Favorable results have been reported following the administration of specific antiserum in the early stages of the disease, and also in cases with commencing icterus. The best results, however, are obtained when serum is given within the first three days of the onset. Since jaundice does not appear regularly before the fifth day, the clinical diagnosis depends on the recognition of such symptoms as abrupt febrile onset, muscular pain, "red eyes" and marked prostration. None of these symptoms, however, can be held to be specific for Weil's disease, since they may occur in many acute infections.

This is particularly true of influenza and acute tonsillitis. While it is true that the occurrence of a sudden acute fever in a sewer worker might suggest the possibility of leptospirosis, even in the preicteric stage, the problem is entirely different in workers connected with fish curing and cleaning. For every case of Weil's disease occurring among the thousands of fish workers in Aberdeen there must be hundreds of cases of acute febrile illness of other origin with similar symptoms to those mentioned previously. Weil's disease in the early stages might be suspected on the following additional grounds: a leukocytosis with a shift to the left in the polymorphonuclear series, latent icterus with a direct or biphasic van den Bergh reaction, acute nephritis unassociated with edema or hypertension but indicated by slight albuminuria, the presence of granular and cell casts in the urine and a raised urea or nonprotein nitrogen content in the blood. The tests required to obtain the foregoing data, as well as guinea-pig inoculation with blood, would be impossible in view of the numbers concerned; hence it appears to the authors that the clinical diagnosis in the early stage, before jaundice occurs, presents almost insuperable difficulties. Accordingly, the full benefits of specific serum treatment are unlikely to be realized. In view of the practical difficulties connected with guinea-pig inoculation of blood and urine, the seroreaction will remain the chief method by which the diagnosis will be confirmed finally. Since a positive seroreaction does not occur before the seventh day of the disease, the information obtained is of little value in regard to treatment. Schüffner's investigations indicate that this reaction in Weil's disease is as specific as the Widal reaction in typhoid. The authors' experience is in keeping with this, since serums from 180 cases other than those of Weil's disease have been examined, and in no instance has the reaction been obtained even in a dilution of 1 : 10.

Glasgow Medical Journal

5: 1-48 (Jan.) 1935

Surgical Shock. A. Clark.—p. 1.
Effect of Continued Unemployment on Health of School Children in Depressed Area. H. W. O. Frew.—p. 8.
Rabelais: Physician and Humanist. E. H. L. Oliphant.—p. 14.

Journal of Laryngology and Otology, London

50: 1-72 (Jan.) 1935

Chronic Pyogenic Inflammation of Antrum and Other Accessory Sinuses (Some Clinical Manifestations of Its Pathology). H. Tilley.—p. 1.
Precancerous Epitheliomatosis (Bowen's Disease) of Palate and Fauces. W. Howarth.—p. 28.

Journal of Physiology, London

83: 129-254 (Dec. 31) 1934

Variation in Activity of Rabbit Hypophysis During Reproductive Cycle. R. T. Hill.—p. 129.
Species Variation in Gonadotropic Activity of Hypophysis. R. T. Hill.—p. 137.
The Assay of Progestin. M. K. McPhail.—p. 145.
*Further Experiments on Relation of Pituitary Gland to Action of Insulin and Adrenalin. O. Cope and H. P. Marks.—p. 157.
Effect of Cortical Stimulation on Gastric Movements in Monkey. D. Sheehan.—p. 177.
Reflex Interruptions of Rhythmic Discharge. E. C. Hoff, H. E. Hoff and D. Sheehan.—p. 185.
Conditions of Fetal Respiration in the Goat. J. Barcroft, R. H. E. Elliott, L. B. Flexner, F. G. Hall, W. Herkel, E. F. McCarthy, T. McClurkin and M. Talatt.—p. 192.
Utilization of Oxygen by Uterus in Rabbit. J. Barcroft, L. B. Flexner, W. Herkel, E. F. McCarthy and T. McClurkin.—p. 215.
Hemoglobin Function in the Developing Chick. F. G. Hall.—p. 222.
Development of Blood Pressure Reflexes. G. A. Clark.—p. 229.
Fate of Carotene Injected into Circulation of the Rat. J. C. Drummond and R. J. Macwalter.—p. 236.
Origin of Wever and Bray Phenomenon. C. S. Hallpike and A. F. Rawdon-Smith.—p. 243.

Relation of Pituitary to Action of Insulin and Epinephrine.—The experiments of Cope and Marks on rabbits confirm the evidence that the anterior lobe of the pituitary plays an important part in the normal glycogenolytic action of epinephrine and that in its absence the glycogen, of the liver at any rate, becomes resistant to mobilization by epinephrine. Their observations show that after removal of the pituitary body the adrenals respond normally to insulin hypoglycemia by liberating epinephrine into the blood stream, yet this epinephrine fails to restore the lowered blood sugar to the normal level, in spite of the presence of ample reserves of liver glycogen. The hyperglycemic response to injected epinephrine is likewise diminished. Converse changes, viz., a resistance to insulin and an increased response to epinephrine, are produced by injection of a suitable extract of the anterior lobe of the pituitary. The foregoing changes are explained on the supposition that the anterior lobe of the pituitary contains a principle which renders the glycogen stores of the liver, and possibly also those of the muscles (now under investigation), susceptible to the mobilizing action of epinephrine. The changes following removal of the hypophysis cannot be reversed by the administration of thyroid, and hence they are not due to the concurrent thyroid degeneration. Conversely, the changes produced by the injection of anterior pituitary extract are not prevented by the removal of the thyroid.

Practitioner, London

134: 1-120 (Jan.) 1935

Treatment of Chest Diseases. R. A. Young.—p. 1.
Diagnosis and Treatment of Empyema. L. S. T. Burrell.—p. 7.
Place of Surgery in Chest Disease. A. T. Edwards.—p. 14.
Bronchitis. T. S. Nelson.—p. 26.
Treatment and Prognosis in Acute Lobar Pneumonia. J. W. Linnell.—p. 39.
Prognosis and Treatment of Bronchitis and Bronchopneumonia in Children. B. Schlesinger.—p. 50.
Conditions Simulating Pulmonary Tuberculosis. G. Marshall.—p. 62.
Some Practical Points in Treatment of Consumptives at Their Homes. A. French.—p. 75.
Significance and Treatment of Cough. J. B. Alexander.—p. 83.
Favorite Prescriptions: I. The Pharmacopeia of St. Bartholomew's Hospital. P. Hamill.—p. 96.

South African Medical Journal, Cape Town

8: 901-936 (Dec. 22) 1934

The Medical Curriculum. S. F. Silberbauer.—p. 903.
*Diagnosis and Treatment of Allergies. J. Pratt-Johnson.—p. 905.
Cause of Death in High Acute Intestinal Obstruction. M. Cole-Rous.—p. 909.

Djagnosis and Treatment of Allergies.—Pratt-Johnson discusses the preparation and use of various group protein solutions consisting of twenty-five compound extracts for diagnosis and treatment of hay fever and asthma. The cutaneous or scratch test is recommended for general adoption. General reactions are much less likely to occur with the scratch test than with the intradermal. Dilute solutions and limitation to six or eight tests at one sitting are essential if the intradermal method is used. Treatment with a series of graduated doses prepared from all the extracts which give positive tests is recommended, beginning with an initial dose of 2½ units. Increasing doses are given at intervals of three or four days up to 60 units, and then further doses at intervals of from five to seven days up to 250 units. At least twelve to fifteen doses should be given. Further maximal doses are then advisable at monthly intervals. Treatment should be commenced as soon as the diagnosis is made. Peptone solutions, mixed B. coli and streptococcus vaccines and other substances may be used nonspecifically to reduce sensitiveness to foreign proteins generally. In asthma following infectious catarrhs, the removal of foci of infection and treatment with autogenous vaccines is recommended. It is advisable, in these cases, to exclude other causes by carrying out skin tests.

Tubercle, London

16: 145-192 (Jan.) 1935

Reinfection in Tuberculosis. L. S. T. Burrell.—p. 145.
Protein Therapy and Chemotherapy in Genito-Urinary Tuberculosis. T. E. Hammond.—p. 152.
Histology of Tuberculous Cavity Wall. S. R. Gloyne.—p. 161.

Japanese Journal of Experimental Medicine, Tokyo

12: 503-612 (Dec. 20) 1934

Influence on Respiratory Metabolism of Liver Cell Constituents Injected Parenterally into Rabbits: First Report. Influence of Liver Cell Constituents on Respiratory Metabolism of Normal Rabbits. F. Kobayashi.—p. 503.
Id.: Second Report. Influence of Cell Constituents of Organs Other Than Liver on Respiratory Metabolism of Normal Rabbits. F. Kobayashi.—p. 517.
Id.: Third Report. Influence of Liver Cell Constituents on Gaseous Metabolism at Time of Taking Food. F. Kobayashi.—p. 553.
Relation Between Toxicity of Ricin and Temperature of the Frog's Body. H. Moriyama.—p. 591.
Studies on Etiology of Scarlet Fever. A. Imamura, H. Ono, T. Endo and I. Kawamura.—p. 601.

Presse Médicale, Paris

43: 57-80 (Jan. 12) 1935

*Synchronal and Rhythmic Myoclonic Syndrome. G. Guillain and P. Mollaret.—p. 57.
*Chronic Intoxication by Manganese Compounds: Manganous Parkinsonism. L. Lyon-Caen and A. Jude.—p. 60.
Studies on Postinsulin Hypoglycemia in Diabetic Patients. J. Penson and J. Wohl.—p. 63.

Myoclonic Syndrome.—Guillain and Mollaret discuss the rare condition of myoclonia. Three conditions appear able to inhibit such myoclonias. The first is voluntary muscular contraction, but this exists only in certain patients and often only at the beginning of their illness. The other two are paralysis and perhaps contracture. Synchronism constitutes the final characteristic of these myoclonias. Anatomic studies indicate that in three fourths of the cases the etiology is vascular. More rarely sclerosis, epidemic encephalitis, tumors and other causes may be etiologic. The location of the lesion is circumscribed. One observation localized the lesion exclusively in the two olivodentate complexes. The involvement of these bulbar olives was most striking and predominant at the level of the caudate portion of the principal olive, the endociliary and periciliary myelin sheath of which had almost entirely disappeared. The neuroganglionic cells were diminished in number and showed bullous degeneration and nuclear bipartition. The vessels of the olivary region showed lesions of intense perivascular inflammation, which were found in an attenuated form outside the olives. To these olivary lesions were added involvement of the olivodentate fibers and especially of the dentate nucleus. These showed a degeneration of the extraciliary interlacing fibers and an abnormal pigmentary infiltration of the cells.

Intoxication by Manganese Compounds.—Lyon-Caen and Jude state that the use of manganese in France is relatively infrequent since it must be almost entirely imported. Most of the mineral is in the form of oxides and it is used principally in iron metallurgic and grinding factories. The route of toxic absorption is poorly understood but may be digestive, respiratory or even cutaneous. The action on the nervous system appears to be an encephalomyelitis with predominating involvement of the central gray matter—cellular degeneration in the lenticular and caudate nuclei with vascular and perivascular lesions. The action on the liver is acute hepatitis with necrosis, blood effusion and beginning cirrhosis. In small doses manganese may be substituted for iron in the blood, producing an increased number of cells and hemoglobin, but grave and fatal anemia may occur from large or continued doses. Little is known of its accumulation in the body. It is eliminated by the bile and feces and slightly in the urine. The characteristic symptomatology is parkinsonism. Six groups of symptoms are almost constant: (1) difficulties in walking, with muscular hypertonia, rigidity and disorders of coordination; (2) modification of the facies; (3) changes in the voice; (4) shaking; (5) subjective sensory disorders, and (6) psychic disturbances. No cases of death have been reported. Treatment should be based principally on rapid and complete removal of exposure to manganese. Proper hygiene and legislation are important factors in prevention.

Archiv für Kinderheilkunde, Stuttgart

104: 65-128 (Jan. 15) 1935. Partial Index

Local Blood Picture in Erythema Nodosum. D. von Móritz and A. Dóra.—p. 65.
*Dysenteric Vulvovaginitis. Z. Teveli.—p. 69.
*Evacuation Disturbances of Stomach During Childhood. E. Hainiss.—p. 71.
Epidemic of Dysentery During 1933 in Budapest. J. Tamási.—p. 75.
Functional (Orthostatic) Albuminuria. K. Dietl and W. Kohlmaier.—p. 80.

Dysenteric Vulvovaginitis.—Teveli observed two cases of pyuria caused by the Flexner bacillus. The dysentery bacillus produces in the intestine a suppurative inflammation. Involvement of the urogenital system may occur because the frequent stools expose the vulva to contact with the feces. However, since in two other cases the pyuria was preceded only by a mild colitis, he considers an ascending infection more likely. In a girl, aged 1, it was found that the vulvovaginal discharge was only an accompanying symptom of the dysentery, for it was cured within two weeks and the dysentery persisted after that. The bacterial strain yielded by cultures from the vaginal pus proved to be a bacillus of the Flexner Y group. It was agglutinated by the serum of the Flexner Y, the paradysentery bacillus, up to a high titer. It split mannite and maltose but not saccharose, and it did not cause coagulation of milk. The strain yielded by cultures from the stool was of the Shiga-Kruse type. It was agglutinated by the Shiga-Kruse serums up to the final titer, but it did not grow in bouillon, and on milk culture mediums it produced flocculation within two weeks (atypical Shiga-Kruse strain). These observations indicate that the strain in the stool differs from that in the vaginal pus. It is possible that the stool also contained Flexner Y bacilli, which escaped discovery, or it is possible but not probable that the vaginal and fecal strains were identical and assumed different characteristics only because they existed under different conditions. The author points out that such a mutation of the various dysentery types, although considered possible by some investigators, has not been proved.

Evacuation Disturbances of Stomach During Childhood.—Hainiss thinks that in children with lack of appetite the gastric function is not given sufficient attention. For the purpose of examination, the feeding of bismuth paste, against which children often have an aversion, is not necessary and drinking of 0.1, 0.2, 0.25 or 0.3 liter of milk is sufficient, for transillumination reveals whether evacuation progresses satisfactorily or not. Ordinarily the stomach evacuates these quantities of milk in from two to three hours, while in children with lack of appetite the stomach may still be partly filled at the end of this period. To overcome this disturbance the physician should pay attention to the following factors: 1. The composition of the diet should be such that evacuation is facilitated. 2. The intervals between meals must be arranged for the slow evacuation; that is, they should be of sufficient length (at first six hours and later four hours). 3. Attempts should be made to increase the tonus of the stomach by means of medicaments. After the meal the child should rest so as not to burden the hypotonic stomach by the weight of the gastric contents. During the night a Priessnitz compress should be applied. The alkaloids of cinchona bark as well as quinine increase not only the function of the muscular elements but act also as a general tonic.

Archiv für klinische Chirurgie, Berlin

181: 383-478 (Dec. 19) 1934. Partial Index

*Evaluation of the Donor Through Determination of His Psychic-Physiologic Status. T. Chvilivickij.—p. 383.
Anatomy of Umbilical Canal. M. A. Gorelow.—p. 395.
Relationship Between Chondromatosis and Osteochondritis Dissecans in Roentgenogram. R. Töppner.—p. 406.
Hernia and Hydrocele of Childhood. M. Langer.—p. 418.
Pathology of the Coccyx. H. Angerer.—p. 427.
*Observations on Gastro-Intestinal Peristalsis After Operations. M. Mátyás.—p. 432.

Evaluation of the Donor Through Determination of His Psychic-Physiologic Status.—Chvilivickij studied the effect of single and repeated withdrawals of blood on the central nervous system of the donor. He submitted ninety-six donors to the following tests: (1) testing of steadiness of the hand by means of a tremometer; (2) cephalographic studies consisting of kimographic recording of swaying of the body while in the erect posture; (3) determination of the power of mental concentration by solving arithmetical problems; (4) determination of the blood pressure with simultaneous counting of the pulse in order to obtain the amplitude-frequency index, and (5) determination of the skin temperature. The following conclusions were arrived at: 1. Periodic withdrawal of blood in persons without decidedly pathologic reactions is not injurious. 2. The occurrence of certain neuropsychic alterations makes it inadvisable from a social point of view to draw donors from certain occupations. 3. Because the finer functions are most sensitive to loss of blood, the utilization of skilled mechanics or of motor truck drivers is not desirable. 4. Neurotic subjects with pronounced motor and vegetative disturbances are to be excluded. 5. The amount of the blood to be withdrawn depends on the body weight as well as on the question of whether or not this is the donor's first experience. 6. Withdrawal of the following amounts were found to be well tolerated: from 2 to 3.5 cc. per kilogram of body weight on the first withdrawal and from

4 to 6 cc. per kilogram in habitual donors. 7. Rest after giving of blood accelerates the return to the normal psychic-physiologic status. 8. The return to normal psychic-physiologic status takes place quicker after the first withdrawal of blood than after repeated withdrawals. All the alterations noted were most pronounced on the seventh day. The explanation offered is that at this time an energetic regeneration of blood elements takes place, depriving the organism of a certain amount of oxygen. The central nervous system, being most sensitive to oxygen deprivation, shows a lowered capacity for the performance of highly differentiated mechanisms.

Gastro-Intestinal Peristalsis After Operations.—Mátyás made roentgenologic studies of the gastric and the intestinal peristalsis by administering barium sulphate by mouth immediately after the operation. He found that emptying of the stomach was delayed for at least ten hours and, after operations on the stomach, for fifty-two hours. Early oral administration of water following an operation may therefore result in acute dilatation of the stomach. This is particularly likely to happen after partial gastric resection. The author advises abundant preoperative administration of water but warns against this for at least from twelve to twenty-four hours after any surgical intervention. The water in the meantime may be supplied by the rectal and hypodermic routes.

Deutsche medizinische Wochenschrift, Leipzig

61: 121-160 (Jan. 25) 1935. Partial Index

Counting of Labor Pains in Obstetric Practice. K. F. Schultze.—p. 121.
Duration of Birth, Acceleration of Birth and Alleviation of Pain. W. Kaute.—p. 124.
*Further Experiences with Transfusion of Blood of Pregnant Women. K. Ehrhardt and H. Winkler.—p. 127.
Early Diagnosis of Cancer by Gynecologist. K. Lange.—p. 130.

Transfusion of Blood of Pregnant Women.—Ehrhardt and Winkler point out that Ehrhardt employed the transfusion of blood of pregnant women in patients with amenorrhea a number of years ago but the results were not entirely satisfactory. Clauberg and Siebke employed the transfusion of pregnancy blood in pathologic genital hemorrhages that were caused by persistence of the follicle, for it was Clauberg's aim to destroy the persisting follicle by large amounts of the hormone of the anterior lobe of the hypophysis. Siebke, in his studies on the hormone foundations of pathologic genital hemorrhages, came to the conclusion that the combined administration of a hormone extract of the anterior hypophysis and of 100 cc. of pregnancy blood made surgical intervention unnecessary in many instances. The authors employed injections of pregnancy blood within the last four years in twenty-five patients with glandular hyperplasia. The quantities of blood varied between 500 and 1,000 cc. In ten patients it was possible to observe the results for two years or longer, and the histories of these patients are reported. In three patients the treatment failed; in five a permanent normalization of the menstrual cycle was attained; in two others the treatment was partly successful. These results indicate that the treatment represents a therapeutic advance, at least in regard to the genital hemorrhages caused by persistence of the follicle. The authors assume that the results of this treatment are largely due to the anterior pituitary hormone content of the pregnancy blood, and they think that, when pregnancy blood is not available, concentrated hormone preparations of the anterior hypophysis may be administered. However, in patients who have lost a large amount of blood, transfusion is the better method, since it supplies blood, hormones and other stimulating factors.

Klinische Wochenschrift, Berlin

14: 73-112 (Jan. 19) 1935. Partial Index

Nervous Regulation of Fat Metabolism. F. X. Hausberger.—p. 77.
*Influence of Spleen Extract on Coagulation Time, Thrombocytes and Erythrocytes. E. Haenlein and E. Schliephake.—p. 79.
Mixed and Secondary Infections. J. Grillo.—p. 83.
Clinical Aspects of Late Eunuchoidism. B. Aschner and A. Buch Casamor.—p. 86.
Clinical Observations on Eighty Cases of Tumor of Hypophysis. G. Perémy.—p. 92.
*Function of Fluorine in Human Organism. L. Michaëlis.—p. 94.

Influence of Spleen Extract on Thrombocytes and Erythrocytes.—Haenlein and Schliephake made studies with a spleen extract from which most of the protein substances had been removed without destroying the physiologically active substances. They tested and standardized the extract by sensitization of the vagus of rabbits or by increasing the phagocytosis of human blood. With the latter method they were able to detect extremely small quantities. To determine the action of the extract on the blood they made their tests on healthy persons who applied for a health certificate, on persons who were in their fourth week of treatment for duodenal ulcer, on patients with nervous heart, aortic defects or asthma, and on persons taking a reducing treatment. The persons had to fast during the entire duration of the test. First blood was withdrawn for the determination of the normal coagulation time and to detect the normal number of erythrocytes, leukocytes, thrombocytes and reticulocytes. Then 2 cc. of the spleen extract was injected subcutaneously. The coagulation time was determined 5, 15, 30 and 60 minutes after the injection and later every 30 minutes until 210 minutes had elapsed since the injection. The erythrocytes, leukocytes, thrombocytes and reticulocytes were counted 30, 90 and 150 minutes after the injection of the extract. The authors observed that the spleen exerts a regulatory influence on the coagulation, that the erythrocytes and thrombocytes increase in healthy persons, that the action on the leukocytes is variable, and that the reticulocytes remain uninfluenced. They conclude that, in the defense against disease, the spleen not only increases the phagocytic power but also contains hormone-like substances that exert their influence on the composition of the blood.

Function of Fluorine in Human Organism.—Michaëlis points out that studies have disclosed that fluorine is a constituent of bones but that it decreases with advancing years. It has been assumed that the greater brittleness and the poorer healing tendency of the bones of older persons has some connection with the lesser fluorine content. The quantity of fluorine, when compared with other constituents of the bone, is extremely small, but it may play the part of a catalyzer. He calls attention to the work of Gautier and Clausmann. Gautier was of the opinion that fluorine is a sensitizer for phosphates and that it enables the phosphorus compounds to combine with the tissues. This means that the presence of fluorine is essential for the formation of calcium phosphate in the tissues. This factor is important in the treatment of calcium deficiency of the skeleton, and he is now engaged in research on this problem. He calls attention to factors that indicate an antagonism of fluorine and iodine in the organism: to the deleterious effect of the use of iodine on fractured bones, to the possibility that an excess of fluorine as well as a deficiency of iodine may play a part in endemic goiter and to the fact that small doses of iodine have been found helpful in counteracting the symptoms of arteriosclerosis. The antagonism of fluorine and iodine suggests the possibility of treating iodine idiosyncrasy with a fluorine preparation.

Medizinische Klinik, Berlin

31: 37-68 (Jan. 11) 1935. Partial Index

Cardialgias and Aortalgias (Angina Pectoris). R. Schmidt.—p. 37.
*Foundations and Results of Vaginal Insulin Therapy in Erosions of Uterine Cervix. E. Klaften.—p. 44.
*Oil of Chenopodium in Treatment of Ascariasis During Childhood. Schulz-Schmidtborn.—p. 47.
Results of Encephalography in Epilepsy. A. Wand.—p. 48.

Vaginal Insulin Therapy in Erosions of Uterine Cervix.—Klaften states that for years he has treated erosions of the uterine cervix by means of vaginal insulin therapy and obtained favorable results. The erosions were usually a symptom of cervicitis, but there were also ulcerations in women with prolapse. The treatment was most effective in those developing as the result of the abnormal position of the uterus when the cervix is pressed against the posterior wall of the vagina. The erosions observed were frequently of the coarse papillary form, and on first inspection they occasionally made carcinoma seem possible. These and other types of erosions responded favorably to local insulin therapy. At first the erosions or ulcerations were painted twice daily with insulin and then a tampon was applied that had been saturated with insulin. Later the painting was done only once a day or every second day. The diet provided rather large quantities of car-

bohydrates. The author observed repeatedly that the formerly regular menstruation was retarded after the local insulin therapy. He never observed hypoglycemic manifestations, but he considered it advisable to study the behavior of the blood sugar following local insulin therapy. There is a slight resorption in vaginal application of insulin, especially if erosions exist; however, it is not sufficient to warrant this method in treating patients with diabetes.

Oil of Chenopodium in Ascariasis.—Schulz-Schmidtborn maintains that ascariasis is more frequent in children than is believed and that its symptoms are often mistaken for appendicitis. He emphasizes the necessity of examining the stool for ova. He has used oil of chenopodium with favorable result for years and he has never observed cases of fatal idiosyncrasy or poisoning. He thinks that, if poisoning does occur, it is because no purgative is given with the oil of chenopodium or the purgative is not given in adequate doses. He considers castor oil the most suitable purgative but thinks that, if the medication is left to the parents, castor oil may not be given in sufficiently large doses, since the children are unwilling to take it. To avoid this, he advises simultaneous administration. He recommends the following prescription: oil of chenopodium, from 0.2 to 1 cc.; sucrose, 1.5 Gm.; oil of cinnamon, 3 drops; oil of peppermint, 1 drop; castor oil, sufficient to make 90 cc. This prescription is administered on two successive days. Without evacuating the bowel on the evening before, the children are given at 8, 10 and 12 o'clock in the morning one dose (spoonful) of the prescription. The size of the dose depends on the age, weight and the general condition of the patient. Before the mixture is administered it should be warmed up and well shaken.

Münchener medizinische Wochenschrift, Munich

82: 83-122 (Jan. 17) 1935. Partial Index

Medical Advice About Breast Feeding. L. Schall.—p. 83.
*Detachment of Retina and Accidents. F. Schieck.—p. 86.
Technical Aspects of Biology of Treatment of Wounds. C. Hempel.—p. 88.
Significance of Overextension of Muscles in Paralyses. A. Faber.—p. 91.
Late Arsphenamine Shock. H. Mühlpfordt.—p. 94.
*Serotherapy and Vaccinotherapy in Brucella Abortus Infection. Hilgermann.—p. 98.
Reorganization of Social Insurance in Germany. K. Haedenkamp.—p. 100.

Detachment of Retina and Accidents.—Schieck points out that, if detachment of the retina follows a perforating injury of the eyeball or a severe blow to the eye, the development of the detachment is usually quite clear. However, if the detachment takes place spontaneously, it is more difficult to understand the mechanism. Certain diseases of the eye result in conditions that make a detachment more likely, but there are also cases of detachment in which previous disease of the eye cannot be proved. These cases of detachment are often referred to as "primary." Nevertheless, the opinion predominates that in the latter cases the true factors are only obscure and that a real "primary" detachment does not occur. From the point of view of accident compensation, there are patients who report a relatively slight trauma as the cause of the detachment, such as the dashing of a branch against their eye or being hit in the eye by the tail of a cow, which as a rule leaves no outer signs on the eye. The conditions are more obscure when the patients state that the ocular symptom appeared first after an extraordinary physical exertion, during which there was a rush of blood to the head. In such cases it is difficult for the physician to decide, for a satisfactory decision is possible only if the factors are understood that produce a predisposition to the detachment of the retina. The author is convinced that in a completely healthy eye such causes do not result in the detachment of the retina, and he thinks that a predisposition must exist. He concludes that, when certain predispositions have been produced, even comparatively slight traumas or extraordinary physical exertions are sufficient to produce a detachment of the retina. He thinks that in cases of this nature the patients are entitled to accident compensation and opposes the decision rendered by zur Nedden, who virtually rejects the recognition of compensation claims in such cases. The author shows that zur Nedden justifies his attitude on the basis of a theory that is a complete contradiction to the opinions held by all other ophthalmologists who have studied the problem of detachment of the retina.

Serotherapy in Brucella Abortus Infection.—In Brucella abortus infection, Hilgermann obtains specific serum by immunizing rabbits with a dextrose-bouillon suspension of a concentration of 20 cc. of blood withdrawn from the vein of the patient. In order to activate the immunization, he adds to the blood suspension before injecting a small amount of a suspension of two cultures of Brucella abortus. During the course of the immunization the blood concentration is kept in the anaerobic apparatus at 37 C. Two rabbits are given on two successive days intravenous injections of 2 cc. each of the blood concentration plus the bacilli. After a one day interval they are given another injection, and after that two more injections at three day intervals. Three days after the last, the fifth, injection the blood is withdrawn from the animals and the serum extracted from it. The serum (50 cc.) is injected on two successive days (25 cc. each time). Immediately following the intramuscular injection of the serum, the patient whose history is reported developed fever, but four days later the temperature became normal and the general condition improved. A repetition of the Gruber-Widal reaction several weeks later was negative. During the time the serum was prepared and also after the injection of the serum, the formation of antibodies was stimulated further by injecting at seven day intervals 0.5 cc. of a weak vaccine consisting of the centrifugate of the blood concentration, to which had been added the suspension of two strains of Brucella abortus. The author reaches the conclusion that by specific serotherapy, supported by vaccinotherapy, even the most severe cases of Brucella abortus infection can be cured.

Wiener klinische Wochenschrift, Vienna

48: 65-96 (Jan. 18) 1935. Partial Index

*Influence of Exclusion of Blood Pressure Regulators on Vasoconstricting Action of Blood. T. Konschegg.—p. 65.
Thrombosis and Embolism. H. Eppinger.—p. 68.
*Velocity of Blood Circulation in Patients with Aortic Insufficiency and with Mitral Stenosis in the Compensated Condition. H. Elias and R. Laub.—p. 74.
Infectious Diseases and Hyperthyroidism. A. Hofmann.—p. 80.
*Causal Treatment of Poliomyelitis. E. Barla-Szabó.—p. 81.

Vasoconstricting Action of Rabbit's Blood.—Konschegg found that the blood of normal rabbits exerts a vasoconstricting action on the surviving human artery, beginning at a dilution of from 1:1,400 to 1:1,700. The blood of rabbits with hypertension produces contraction at higher rates of dilution. Depending on the degree of hypertension, contraction is produced by dilutions of from 1:1,700 to 1:4,000. The same proportionate relation between blood pressure and contracting capacity of the blood could be demonstrated also in the serum. The vascular contraction is not caused by epinephrine, but in rabbits with hypertension as well as in those with normal pressure the contraction is caused by so-called constrictines.

Velocity of Blood During Valvular Lesions.—To determine the types of stasis in the various valvular lesions, Elias and Laub decided to study the circulatory velocity in compensated cardiac defects, because it has been demonstrated that the decompensated cardiac lesions have a retarded circulation time. The authors wanted to determine whether the two cardiac defects, which clinically as well as physiochemically (oncotic pressure) presented antithetical symptoms, differed also in the velocity of their circulation. Of the several test methods that have been suggested for the determination of the circulation time, they chose the one that employs a 20 per cent solution of the sodium salt of dehydrocholic acid. They preferred this method (1) because it is rather simple, (2) because it is the least dangerous, and (3) because the diuresis induced by it has a therapeutic effect. The patient was advised to tell at once when a bitter taste appeared. The patient was lying quietly with the arm in the horizontal position, and 10 cc. of a 20 per cent solution of the sodium salt of dehydrocholic acid, diluted with 10 cc. of a 30 per cent solution of dextrose, was injected into the cubital vein. The injection was made in such a manner that 4 cc. of the solution was injected in ten seconds. Even if the bitter taste had already appeared, the

remaining quantity was always injected for therapeutic purposes. The time was determined that elapsed between the onset of the injection and the appearance of the bitter taste. Before the tests were made, the sensitivity of the taste was determined by means of graduated quinine and sugar solutions. The velocity of the circulation was tested in thirty-seven persons. It was observed that in patients with mitral stenosis the circulation time was slightly prolonged, while in those with aortic insufficiency it was considerably prolonged. To what extent the prolonged circulation time is due to a reduced velocity of the blood stream or to retarded secretion of fluid out of the blood stream cannot be determined with these experiments.

Causal Treatment of Poliomyelitis.—Barla-Szabó, after calling attention to the shortcomings of the specific serotherapy, enumerates the factors required of a causal therapy and shows that the virus of rabies meets some of these requirements in regard to poliomyelitis. Accordingly he decided to use the method employed for prophylactic vaccinations against hydrophobia in the treatment of poliomyelitis. The spinal cord of a rabbit infected with rabies served as material. He prepares the vaccination solution in the following manner: The infected material is ground in a sterile mortar and diluted with physiologic solution of sodium chloride. The substance thus prepared can be used for five or six days. The author begins the subcutaneous injections with a solution of 1:500 (0.1 Gm. of brain substance and 50 cc. of physiologic solution of sodium chloride). As a rule, ten subcutaneous injections are required. The first five are given daily and the later five at intervals of two days. The series of injections may be repeated after two weeks. The author employed this treatment in ten acute cases (from three to ten days after onset of the paralysis) and in seventeen subacute cases (from three to six weeks after onset of the paralysis). In the latter group, convalescent serum had not produced the desired results. Since in the small number of acute cases it is difficult to differentiate between spontaneous remission and remission as a result of treatment, he describes only the results obtained in the subacute cases. Two patients with diplegia and two others with diplegia and paralysis of the trunk began to walk again paretically after six days of treatment, and the reflexes likewise returned after another five or six days. In seven other patients, of whom three had monoplegia, three diplegia and one diplegia and paralysis of the trunk, cure was effected in from twenty to twenty-five days. The other six patients showed only slight improvement after twenty and twenty-two days, but after an additional twenty-five or thirty days two of them were cured, three were considerably improved and one was slightly improved.

Norsk Magasin for Lægevidenskapen, Oslo

96: 1-112 (Jan.) 1935

Acute Infectious Diseases and Yearly Seasons. C. Schiøtz.—p. 1.
Sporotrichosis of Lungs: Case. J. A. Voss.—p. 14.
Filariasis: Case J. A. Voss.—p. 17.
Quantitative Urobilin Test. E. Wang.—p. 22.
Pernicious Anemia Without Achylia with Recurring Agranulocytosis: Case. L. L. Linneberg.—p. 31.
*Acute Rheumatism with Abdominal Symptoms, Treated in Surgical Divisions. H. Støren.—p. 35.
Acute Pancreatic Necrosis. R. Steinert.—p. 43.
Purpura During Fibrolysin Treatment. A. Arnesen.—p. 46.
Transportable Roentgen Apparatus and Treatment of Fractures in Lower Extremities. H. C. Wennevold.—p. 53.
Type Determinations of Fourteen Tubercle Bacillus Strains, Isolated from Patients with Tuberculosis of Bones and Joints. P. Anchersen.—p. 61.
*Porphyrin or Porphyrinogen Elimination in Urine in Acute "Idiopathic" Porphyria: Sources of Error in Urine Analysis; New Method for Clinical Use. R. Opsahl.—p. 66.
Pyloric Stenosis with Tetany and Azotemia: Case. R. Opsahl.—p. 81.
*Mesodermic Dystrophia (Marfan)—Arachnodactylia: Case. T. Christophersen.—p. 85.

Acute Rheumatism with Abdominal Symptoms.—Støren says that in the diagnosis of acute rheumatism with abdominal symptoms great importance attaches to the good intestinal peristalsis demonstrable on auscultation in spite of marked muscular resistance and tenderness. In the five cases reported, which were admitted as acute abdominal disorders, the two main types of abdominal pain in acute rheumatism were represented, one with paroxysmal pain with slight or no resistance, the other with marked resistance and tenderness. In the case in which operation was performed there was an acute serous peritonitis. The cause of the abdominal symptoms described is thought probably to be an acute rheumatic peritoneal disturbance of varying intensity.

Acute Idiopathic Porphyria.—Opsahl asserts that the frequent negative results of the urine test in acute porphyria may be due to intermittent elimination and that the color of the urine is no indicator of the porphyrin content. In some cases Garrod's and in other cases Fischer's method prove unsatisfactory. For clinical use the following method for relative quantitative determination in porphyrinuria is presented: The urine is examined in mercury quartz light with Wood's filter for fluorescence. By the addition of iodine (1 drop of tincture of iodine to 5 cc. of urine) the porphyrinogen possibly present, which does not fluoresce, is at once oxidized into fluorescing porphyrin. After the characteristic fluorescence has been found, the substance is identified according to Fischer's method.

Mesodermic Dystrophia (Marfan)—Arachnodactylia.—Christophersen says that his typical case in an infant presents a combination not previously reported, mesodermic dystrophia and congenital pyloric stenosis. After operation for the stenosis a volvulus of the stomach developed; operative treatment was followed by uneventful recovery. Roentgen examination of the patient's cranium revealed a convexity of the orbits toward the foremost groove of the brain, an anomaly also seen in the mother. While lens luxation was not confirmed, there were indications of a luxation or a subluxation. Seven other cases of arachnodactylia on the maternal side of the patient's family are known.

Ugeskrift for Læger, Copenhagen

97: 1-34 (Jan. 3) 1935

Treatment of Burns with Tannic Acid. P. Hansen.—p. 1.
Suprapubic Cystostomy Sequels and Their Treatment: Four Cases. E. Kindt.—p. 6.
Preliminary Remarks on Forms of Dementia Paralytica in Acute Anterior Poliomyelitis. M. Norn.—p. 8.
*Agranulocytosis with Recovery: Case. A. Barfred.—p. 9.
"Uremia" Treated with Sodium Chloride, in Patient with Hematuria: Case. G. Herborg.—p. 13.

Agranulocytosis with Recovery.—In Barfred's case, originated after treatment with amidopyrine, treatment with pentnucleotide and a liver extract (hepsol) was followed by rapid recovery. Tabulation of the course of the blood picture in five cases with recovery reported in the literature and in this case shows identical curves in all cases.

Upsala Lakareforenings Forhandlingar, Uppsala

39: 307-448 (June 15) 1934

Studies on Influence of Some Natural Fats and Their Components on Animal Tissue Structures. E. Agduhr.—p. 307.
Remarks on Dentate Fascia and Its Relation to Sense of Smell (Case of Combined Defect of Olfactory Portion of Brain). S. Oldberg.—p. 395.
Innervation of Musculus Sternalis Also Through Cervical Plexus. K. Martensson.—p. 407.
*Contribution to Knowledge of Thyroid Changes in Nongoitrous, Highly Toxic Form of Exophthalmic Goiter. N. Gellerstedt and E. Norinder.—p. 423.
Familial Multiple Changes in Epiphyses and Osseous Aseptic Necroses: Preliminary Report. S. Ribbing.—p. 433.

Nongoitrous, Highly Toxic Form of Exophthalmic Goiter.—Gellerstedt and Norinder state that their case presented the clinical picture of a disturbance of the heart with gastro-intestinal disorders. Necropsy revealed a small firm thyroid. Histologic examination showed the thyroid to be abundantly vascularized, with strongly increased interstitial tissue, small lobuli and scanty lymphoid foci. The preponderatingly small follicles were covered with a high cylindric epithelium containing abundant fat and vacuoli. The colloid matter was lacking or remarkably scanty, consisting mainly of small homogeneous or granulated spheres and foamlike masses. The follicles also contained abundant desquamated epithelial cells and some red blood corpuscles. In many places the epithelium showed marked proliferation into the follicle lumen. The pronounced changes bore unmistakable characteristics of exophthalmic goiter. The atrophy and the tendency to fibrosis, however, appear rarely and only as the end stage of a long and grave exophthalmic disease.